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An Address.[1]

By JOHN K. ADEY, M.B., B.S., O.B.E.,
Melbourne.

FIRST allow me to thank you for the honour of the presidency of this section. I always think that the Section of Neurology and Psychiatry is a body of a very mixed type. The outlook with which the neurologist approaches his patient is totally different from that of the psychiatrist, and, except that they are both interested in the study of the central nervous system, there is little ground common to both.

[1] President's address, read before the Section of Neurology and Psychiatry at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

For many years neurology and psychiatry have been wedded together in the same section, and in my opinion it is time they were divorced. I do not deny that cerebral lesions cause insanity, that cerebral tumours, epilepsy, cerebral anæmia and similar syndromes can be examined from both the neurological and the psychiatrical points of views; but I see no reason why psychiatry should be linked up with neurology any more than with cardiology, with endocrinology or with other branches of medicine.

Neurology is to be heartily congratulated on the immense strides it made at the end of last century. The work of Fleschig, von Monakow and Horsley will always stand as examples of painstaking research. Further work has now enabled the surgeon to come into his own, and cranial

topography and surgery are now arts equal to that of the abdominal surgeon. The treatment of *myasthenia gravis* is now within the realm of effective therapeutics. One of our most urgent problems is to find a method of treatment of *paralysis agitans*, an extremely common and very distressing malady.

It can now be said that neurology has become an exact science, but unfortunately the same cannot be said of psychiatry. Far from being an exact science, it is merely the observation of a number of symptoms classified together to make diseases, each disease grading into another; frequently the symptoms of several diseases are superimposed on one another and vary almost from day to day.

At the same time, we need not be too pessimistic. Anyone who can remember the treatment of the insane twenty years ago will realize the immense strides that have been made in that comparatively short period. At that time the diagnosis of general paralysis of the insane was tantamount to a death sentence in five years. The malarial treatment, although empirical, was a great step in advance. Freud's psychoanalytical work has thrown a flood of light on the meanings of many of the symptoms of disease. Delusions which before his time were mysteries can now be guessed at, and in some cases adequately (even if not truthfully) explained; and although the therapeutic results of Freud's work have been very disappointing, it undoubtedly has prophylactic value and is of practical value in the psychoneuroses.

The insulin shock therapy for primary dementia is still in the experimental stage, and we must leave to the next congress the decision as to its value and to the type of case to which it is applicable.

The psychological approach to insanity suffered from the fact that the psychology of the normal being is by no means an exact science. Psychology was the science which examined the thoughts and ways of man; but before Freud the psychologist seemed to leave out the man. He appeared to study and classify parts of man, but never the whole man. The pure psychologist seems to have shut his eyes to many of the psychological realities, although they have been repeatedly pointed out to him from the time of Shakespeare onwards.

The general physician can and does assist us, and I think that we could be more helpful to the general physician than we are. Little exact work has been done, or at least has been published, in relation to the alteration in the mind of the patient when he is suffering from a definite physical disease. We all know the irritability of the sufferer from a cardiac lesion and the hopefulness of the tuberculous; but much more could be done in recording the reactions of patients to physical disease at various ages and in various walks of life. In return the psychiatrist undoubtedly has the duty of making exact observations on the physical results of psychological lesions; of the effects, for example, of profound depression on the bodily tissues, and of how unfavourable environment, in the psychological sense, causes actual ill-health. I venture to say that in the out-patient department of every large general hospital there are patients who haunt the out-patient physicians. They travel from one hospital to another, they contract a different disease on every possible opportunity, and they show signs of this disease, all on account of an unhappy married life or of an inability to fight for themselves. They consequently fly to disease, by which they are freed from effort and responsibility. I am not talking of hysterics or of psychopaths; I am talking of patients who are suffering from definite physical lesions.

It is difficult for the general physician to realize not only that a disease caused by and due to a definite pathological lesion needs to be treated from the point of view of that lesion, but also that the state of mind of the patient, due to general unhappiness, makes him particularly susceptible to bacterial invasion, and even to accidents requiring surgical treatment.

Another direction in which research would be profitable if it was undertaken by those who were in a position to undertake it, would be an inquiry into cures by unqualified people. The medical profession as a whole shuts its eyes to the fact that herbalists, osteopaths and similar unqualified people do get a certain number of results. It is quite useless for us to dismiss these results with a wave of the hand and to say they are charlatanry and quite unworthy of any reputable practitioner. I do not suggest that we should copy their methods, neither do I shut my eyes to the fact that a certain number of patients cure themselves without any special treatment; but if the methods of charlatanry have a curative value, these should be subjected to proper scientific investigation and the results should be used in a proper scientific manner.

Similarly, at periodic intervals we hear of numberless allegedly miraculous cures as the result of a religious mission. These cures are attributed to faith. Is faith a name to cover our ignorance, or is it a special faculty of the mind, or is it something bestowed on man from without? Whatever it is, we should investigate its basic principles and apply them in the proper cases. It may reasonably be objected that I am now trespassing on ecclesiastical ground and that ecclesiastical treatment held pride of place, in fact had a monopoly of psychiatry for a matter of some eight hundred years and that its results were by no means conspicuously successful. All this is true; but we can afford to neglect no avenue of approach. Although I am now addressing an audience of medical practitioners, I state that we should, in certain selected cases, cooperate with the priest of whatever denomination the patient follows. In England a chaplain was, and I presume still is, attached to every large asylum. In Australia the chaplains hold a service once a week and feel that their duty is finished. The reason that they adopt this attitude is that they receive no encouragement from the medical superintendent, no suggestions are made to them about cases suitable for their attention; and I am afraid that when they do take

an interest in the cases they are made to feel that they are trespassing where they do not belong. It is my belief that a properly trained chaplain should be looked on as a useful adjunct, in fact as an essential part, of every mental hospital. It may be objected that it is useless for anyone to speak sympathetically to a paraphrenic or to attempt to give religious consolation to a person suffering from general paralysis of the insane; but I consider that the reason why a chaplain to a mental hospital becomes hopelessly discouraged after about two visits is that no one takes the trouble to point out to him which patients he might benefit and on which patients he will only waste his time.

It is characteristic of a member of the professional classes to think that his particular profession is essential for the salvation of society. The educationists, headed by H. G. Wells, tell us that until people are well educated the present international muddle will continue; the military officers tell us that all activities must be subordinated to national defence, and teach us to look with paranoidal suspicion on our neighbours; physicians advocate the improvement of health as the first necessity for the advancement of a nation.

All are right, but by a merciful dispensation of Providence, none of us are able to have our own way and to impose our desires on our fellow citizens. In various countries has arisen agitation, and in some places even legislation has been introduced, for the compulsory sterilization of the unfit. I hope the profession will set its face against legislation of this character, or any legislation by which the general public would be compulsorily driven towards health. Compulsory sterilization is at present like shooting in the dark; our knowledge of eugenics is not yet sufficiently advanced; the results at which we aim cannot be precisely defined; and if we did, by some miracle, achieve a result, we should find the result would be totally unlike what we expected. We should endeavour by all means in our power to forward legislation to promote the health of the people, provided it meets with the approval of the community in general. Every encouragement should be given for the abolition of slums and for the welfare of young children; but any attempt to bully the general public into taking care of its own health will recoil on our own heads by depriving us of the confidence of the general body of intelligent people. The function of the profession is to act as medical advisers, not as medical commanders.

Finally, allow me to welcome you to this section of the congress. I am sure that the discussions will be of benefit to all of us. I am pleased that we are cooperating in one session with the ophthalmological section. The ophthalmoscope is probably the most important single instrument in the armamentarium of the neurologist or psychiatrist. At every congress I have attended I have felt that a certain amount of progress has been made since the preceding one, and as far as the Victorian mental hospitals are concerned, I think that closer cooperation with specialists in other branches of medicine and surgery is one advance we are now making. Every mental hospital for acute cases should have on its staff a consultant of every specialty, and should have ready access to an X ray plant and to a biochemical laboratory; and I think that one of the most striking advances in the last twenty years has been the closer cooperation of the psychiatrist with the general hospital.

THE ASSESSMENT OF THE PHYSICAL FINDINGS AND THE ASSOCIATED STRUCTURAL CHANGES IN PULMONARY AND CARDIAC DISEASE.[1]

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He who knows not, and knows not that he knows not is a fool. Shun him.
He who knows not, and knows that he knows not is simple. Teach him.

(Arabian proverb quoted by Osler.)

I wish to thank you for the honour you have done me in inviting me to address you this evening. I do so as one who is a searcher for knowledge, and trust that a consideration of this Arabian proverb has induced that attitude of mind so necessary in one who has taken upon himself the rôle of teacher.

Recently the Regius Professor of Physic at the University of Cambridge discussed very wisely and temperately the relationship that exists, or should exist, between the clinical and scientific aspects of the study of medicine. Professor Ryle stated that the aims of medical science were to perfect our knowledge of disease in man, and equally our knowledge of man in disease. May we all be true to the ideals which Osler, Ryle and others have so clearly laid down for our guidance. If it appears that I have during the course of these lectures belittled any of the older methods of examination, or that I have laid too great emphasis upon the newer instrumental methods, I crave your indulgence. It is not my intention to enter upon any argument as to the relative merits of clinical and radiographic study in thoracic disease. Ever since the days of Laennec we have been endeavouring to improve and render more accurate clinical examination. The airy abandonment of such effort in favour of some new gadget would mean that we dishonoured his name and took a serious retrograde step. I often wonder whether the physicians of the younger generation have not already suffered in their ability to diagnose disease because of the fascination of some of the newer methods of examination. On the other hand, if some aspect of clinical diagnosis needs "debunking", let us have the courage to do it.

[1] Three lectures delivered at Brisbane for the Queensland Post-Graduate Committee in June, 1937.

When we consider pulmonary and cardiac diseases we find that on occasions it is difficult to determine whether the origin of the symptoms in question is to be found in the heart or in the lungs. Pulmonary emphysema furnishes a good example of this point. In this disease clinical examination may give very little evidence of cardiac involvement. Indeed, gross cardiac enlargement and displacement may be present and yet, so completely has the heart been enfolded by the emphysematous lung, these facts are entirely concealed. We may have to wait until congestive failure, with its associated enlarged liver and œdema, appears before clinical examination alone gives unequivocal evidence of the presence of cardiac damage.

I believe that whenever we approach a case of suspected thoracic disease we should, after obtaining a careful history, make a detailed examination of the physical signs presenting. Then, and then only, should we proceed to the radiographic investigation. I propose at a later stage to show you some of the results I have obtained by tomography and kymography. It will be apparent then, if not before, that these methods suffer from one great disability, namely, lack of accessibility. Probably very few of you are personally acquainted with the necessary equipment for this work, but all of you can undertake clinical examination without restriction as to time and place.

Anatomical and Physiological Considerations.

A knowledge of the anatomy of the thoracic cage, of its contents, and of the events occurring during the respiratory and cardiac cycles, constitutes an essential basis for the adequate study of chest disease.

Dunham[1] has divided the lung fields as seen below the clavicles (in the frontal plane) into three arbitrary zones: inner, central and outer. The inner contains the hilar structures, the middle the larger bronchial subdivisions, and the outer the finer bronchioles and the alveoli. The hilar shadow as seen in the radiograph is the sum total of all the structures in this region: the main bronchi, pulmonary artery and veins, bronchial artery, lymphatic vessels and glands, and a certain amount of supporting connective tissue. The middle zone pattern consists mainly of linear markings produced by bronchioles, blood vessels, lymphatic nodes and lymphatic deposits, together with some connective tissue. The strial markings shade out imperceptibly into the peripheral zone (see Figures IX and X).

The minute anatomy has been described by Miller,[2] and as a knowledge of this is necessary to an understanding of the changes produced by disease processes, I shall describe it briefly. As the bronchial tree is followed to the periphery, the bronchioles are seen to open directly into the alveoli. Each bronchiole divides into two alveolar ducts. These in turn divide into three atria. Each atrium opens into a variable number of air sacs, each of which has projecting from its surface numerous air cells. The respiratory unit is the lobule. Such a primary lobule comprises an alveolar duct, the associated air spaces and their vessels and nerves. There is a double blood supply from the pulmonary and the bronchial artery. The pulmonary arterial system corresponds with the bronchi, dividing and subdividing with them until the bronchioles are reached. Two small branches then supply the atria. The final vascular subdivision occurs in time for one terminal branch to go to each air saccule. The capillary bed is then reached, this completely surrounding the alveoli and anastomosing with capillaries from the pulmonary vein. The bronchial artery is concerned mainly with the nutrition of the larger bronchi and bronchioles; but it also supplies the pleura, which it reaches by way of the interlobular septum. The venous return is common to both the pleural and the pulmonary circulation. According to Santé,[3] this communication between the pleural and pulmonary circulation may explain some of the unusual findings occasionally seen in radiographs. Both arteries and veins are surrounded by a network of lymphatics which communicate freely with the bronchial lymphatics. The pleural lymphatics bear no relation to lobule formation, but form a rich network all over the surface of the pleura, this permitting rapid absorption or transudation of fluid. The two great lymphatic systems, pleural and pulmonary, while being independent entities, communicate freely. But their direction of lymph flow is different. One drains the area of the respiratory bronchiole inwards towards the hilum, while the flow of the other is outwards to the pleura and then over its surface and finally towards the hilum.

We must remember also that there are collateral openings in the alveolar septa. When a lobe collapses it therefore follows the all-or-nothing principle. Either the whole lobe is involved or it is not involved at all.

During inspiration there is an increase in all the diameters of the thoracic cage. This is mainly transverse; but some increase occurs in the vertical axis. The central tendon of the diaphragm descends, the dome of the diaphragm flattening by muscular contraction, with resulting gain in thoracic volume. In advanced emphysema an increase in the thoracic excursion occurs if a firm abdominal belt is applied. As it descends the diaphragm is capable of exerting considerable pressure on the abdominal organs, and it may displace the lower ribs laterally. As this movement occurs the lungs follow suit until their bases occupy the whole of the pleural sinus.

During inspiration air rushes into the air sacs by way of the alveolar ducts and a jet-like action is produced which facilitates aeration. Approximately one-third of the inspired air is wasted because it ventilates the bronchial tree only. This dead space is very important. The smaller the quantity of air inspired, the greater is the ratio of this fixed dead space. With rapid and shallow breathing the percentage of ineffective air may become very great.

During respiration considerable movement occurs in the mediastinum, this movement being mainly in the vertical plane. During inspiration the heart becomes more nearly vertical and appears to be longer and narrower. The aortic arch is pulled down by the heart in its descent approximately two centimetres. As the descending aorta is fixed, the movement is therefore comparable with a Chinese lantern dangling on a bamboo pole. The trachea, bronchi and roots of the lung have a similar up-and-down movement, all these structures moving in unison. It is obvious that if there is no respiratory descent of the larynx, the trachea must lengthen during inspiration. This lengthening is about 18 to 19 millimetres and takes place without any forfeit in cross-section. We can see then the tremendous part played in the whole broncho-pulmonary tree by the elasticity of the lung structures. We can describe three movements occurring in the bronchi: (i) an up-and-down movement, the excursion being approximately one centimetre; (ii) lengthening and shortening; (iii) dilatation and narrowing.

The roots of the lungs are flexible and freely movable. The lengthening and shortening which occur during inspiration and expiration affect the bronchial tree even to its final subdivisions, and it is this elongation which gives the lung its added volume. It is not difficult to believe that any loss of homogeneity in the lung structures may predispose to abnormal drag (in some particular area) when we consider the range of movement that occurs. We must attach the greatest importance to the elastic and muscular tissue of the smaller bronchi in the prevention of damage to the lungs by the respiratory movements.

The Thorax in Disease.

So much, then, for the actual physical events occurring during respiration. The distension of both sides of the chest should occur equally and synchronously. We may, by carefully observing a patient in a good light, discover lag on one side, and similarly localized inspiratory retraction may indicate deficient air entry. Inequality of, or asynchronism between, the filling of the two sides constitutes a most important clinical sign. Tuberculosis is probably the most common ætiological agent; but many conditions, such as pneumonia, pneumothorax, pleural effusion or adhesion, may produce it. We should attempt to determine the depth and rate of movement. I have already stressed the mechanical inefficiency of rapid and shallow breathing.

Normally the mediastinum is fairly movable. But the weight of large effusions may cause a deviation of the mediastinal structures to the opposite side. The pressure of gas in pneumothorax will have the same effect. When the pressure is the same on both sides of the chest, respiration produces no flapping of the mediastinum. But if there be obstructive emphysema or atelectasis (as in bronchial carcinoma), deviation of the mediastinum may result. The mediastinum of a child is very flexible, that of an adult less so. Any severe inflammatory reaction may lessen this mobility or actually produce fixation.

There are many conditions other than tuberculosis which produce mediastinal displacement. The normal chest is symmetrical whether the patient be tall and thin or fat and short, and any lack of symmetry betokens a pathological cause. Narrowing of one side of the chest may be due to many conditions, such as paralysis of the diaphragm, atelectasis or a chronic fibrotic process in one lung. Enlargement of one side of the chest will equally produce asymmetry, such conditions as tumour, pleural effusion or unilateral emphysema (either obstructive or compensatory) being frequent causes of this event. Generally speaking, the mediastinum moves to the smaller side. If there be collapse of one lung, the mediastinum moves to that side, and if there be enlargement it moves away from the lesion.

The mediastinal shadow in the radiograph may be distorted considerably by primary mediastinal lesions, such as newgrowth or abscess, without any tendency of the mediastinum to move to either side. Extrinsic pressure may be exerted upon mediastinal structures independently of the lungs. Such conditions as a substernal thyreoid, aneurysm or mediastinal newgrowth may all distort the mediastinal shadow. If a careful search of the lungs by clinical and radiographic examination fails to show any primary lesion in the lungs, then a careful review of all the structures traversing the mediastinum is necessary to discover the lesion responsible for the distortion of the mediastinal shadow seen in the radiograph.

I have on more than one occasion seen œsophageal carcinoma missed clinically, in spite of the presence of dysphagia, because the examination has not elicited the fact that the patient has difficulty in swallowing, some other cause for the mediastinal mass then being searched for.

The entry and exit of air set up physical vibrations which are conducted throughout the broncho-pulmonary structures. This conduction probably occurs both by way of solid structures and of the air columns in the respiratory passages. During inspiration air eddies are formed in the air saccules, which add a local factor to any vibrations conducted peripherally from the larynx. On the other hand, the expiratory phase of the vesicular murmur (as detected by the stethoscope) is probably wholly conducted from the larynx. The breath sounds and the voice sounds are produced at the larynx and similarly modified by the pulmonary matrix.

Recently, Wright[4] has investigated pulmonary resonance by means of an interesting experiment. He actuated a loud speaker of the enclosed membrane type by a constant audio-frequency. Instead of a horn the loud speaker was fitted with a rubber tube. By placing this in the patient's mouth Wright was able to feed a note of fixed amplitude and pitch into the respiratory tract. Using a note with a

frequency of 256 vibrations per second, he found (in the normal subject) that if the volume of sound was reduced so that it was just audible throughout inspiration (when listened for with the stethoscope), it was audible throughout the whole period of expiration. Over the trachea a marked accentuation of the volume of sound was present. In one patient with displacement of the mediastinum the change in character of the tracheal note enabled him to trace the displaced trachea over to the base of the spine of the scapula by a continuous line of resonance. In some cases with consolidation the conduction of his generated sound was increased above normal during both inspiration and expiration. When fluid was present in the pleural cavity the sound was not conducted over the area of the effusion, the finding agreeing in this respect with the vocal resonance and the breath sounds. He was of the opinion that evidence existed to support the view that at least some of the sounds which are ordinarily called "breath sounds" have their origin in lung tissue. He considered, moreover, that resonance in a pulmonary cavity was not resonance of the cavity alone, but of the cavity as a part of the whole air column in the respiratory tubes. It is obvious, then, that the patency or otherwise of the opening into the cavity from the broncho-pulmonary passages plays a definite part in the production of the signs of cavitation.

Bendone[5] has drawn attention to the variable auscultatory signs present in relation to pulmonary cavities. In a series of 350 cases of pulmonary cavitation he found cavernous breathing in only 104 (29·7%). In 33 (9·4%) he found no indication whatever of the presence of cavities. In 177 (50·6%) the cavernous sound was missing; but the presence of cavitation was revealed through other signs. In 36 (10·3%) there were variable signs from day to day. At times these cavities were absolutely silent to auscultation, the stethoscopic signs being intermittent and variable in duration. He concluded that the factors of primary importance in the production of the variable signs of cavitation were the communication with the bronchus, the consistency of the capsule of the cavity, the topographic relations, the exact condition of the surrounding lung parenchyma, and the medium of conduction. He found that the most significant and common signs of early cavitation were modification of the breath sounds and the associated presence of localized coarse râles heard during ordinary respiration. Such cavities as a rule have soft and yielding walls and are easily amenable to collapse therapy. Cavernous breathing generally indicates an older cavity. The absolutely mute cavities require radiography for their diagnosis.

It should be remembered, however, that many pulmonary cavities are missed in the ordinary radiograph. The advent of tomography has shown us clearly that if the simple film reveals one large apical cavity in chronic pulmonary tuberculosis, the tomogram will generally indicate two or three smaller ones in association.

Thomas and Hallam[6] reviewed one thousand consecutive cases referred for radiography in private practice and attempted to correlate the radiological and the clinical findings. They found that in 196 the signs of pulmonary tuberculosis were present. They concluded that while X ray examination was a powerful aid in the diagnosis of pulmonary lesions, it was not by any means conclusive, and that the history and the local and general symptoms were very important for diagnosis. Local physical signs were considered to be very variable, and often relatively unimportant for diagnosis. But the X ray appearances must be subjugated in many cases to biological test and symptoms. They drew up a sliding scale showing what was in their opinion the relative value of X rays as an aid to diagnosis in pulmonary disease.

Radiography in Pulmonary Tuberculosis.

The great value of radiography in the diagnosis of pulmonary tuberculosis is, I think, generally admitted. In such cases what do we really want to know? First, is a tuberculous infection present? Secondly, is it recent or old? Thirdly, has change been induced in the mediastinum?

Melville,[7] in 1929, made these statements:

1. Definite infiltration can be demonstrated upon an X ray film at quite an early stage of the disease and frequently before definite physical signs are evident.
2. X ray evidence extending over a period of some months and consistently negative may be taken as conclusive evidence of the non-existence of pulmonary tuberculosis.
3. That in cases in which physical signs are present it may be assumed that the initial stage has passed. The X ray picture will show as a rule much more extensive disease than can be demonstrated by physical examination.

With these statements Dr. Hallam and I are in substantial agreement.

By tomography it has been shown that the so-called pleural rings (seen in pulmonary tuberculosis) are practically always due to cavities.

Clinical methods of physical examination are often clumsy, time-consuming and inaccurate, but I do not for one moment suggest that we should not strive to perfect them. Rather do I urge that we should increase our efforts to place simple physical signs on a sounder basis. But, above all, let us keep our perspective.

Radiology is exceedingly important in the control of pneumothorax therapy. By this means we can carefully watch the progress of cavities during this treatment. Above all we can watch the contralateral lung; faithful study of this presumably unaffected lung must be made at every X ray examination undertaken during the period of artificial pneumothorax. One must therefore insist that the degree of collapse, which can be assessed on screening only, must not be the only consideration, but that a film should also be taken at every X ray observation so that the contralateral lung may be minutely observed. This is particularly important also because it is very difficult to distinguish congestion from an early exudative lesion at one X ray exam-

ination, serial films being necessary for definite diagnosis. Critical examination with a stethoscope over a suspected area may enable the clinician to make up his mind, as crepitations may be heard if there is an exudative lesion present. The see-saw type of pneumothorax therapy, used when both lungs are affected, collapse of each lung in turn being effected, must be controlled by frequent X ray examination, as by a system of delicately adjusted alternate compression laudable victories may be attained.

We must avoid any gross displacement of the mediastinum, such displacement being an important factor in the production of dyspnœa. We desire a fixed mediastinum, against which the diseased lung may be pushed. Fortunately we can estimate the flexibility of the mediastinum by screening. If the mediastinum be mobile, during expiration heart and mediastinum are, in the presence of pneumothorax, displaced to the contralateral side.

The Prognosis in Pulmonary Tuberculosis.

What of the prognosis in pulmonary tuberculosis? With proper care and observation over a period of time we can in nearly every case be sure of the diagnosis, as long as we suspect the disease. But, having established the diagnosis, how can we determine the course the disease is likely to take?

I believe that the experience and consequent intuition of the physician are generally the ultimate tests in prognosis, and that no single method, whether it be radiological, biochemical or clinical, can be relied upon to provide an accurate prognosis. I have the distinct impression that in Australia we have seen a definite improvement in the general course of this disease. Certainly we react differently from our countrymen in Great Britain; take for example the rarity of Bazin's disease, lupus, and other tuberculides in this country as compared with England. In the Frimley Sanatorium report for 1935 it is stated that "The prognosis of chronic pulmonary tuberculosis varies directly with the extent of lung involved". Provided the extent has been estimated radiographically, this is true. But we must remember that an X ray film may one day show widespread allergic reaction and yet, within a few months, almost complete disappearance of the radiological manifestations may occur. Prognosis should always be reserved until time has permitted the observer to watch the progress of the lesion under proper sanatorium conditions, whether these are provided actually in a sanatorium or not. If under these conditions the sputum remains positive over a period of, say, eighteen months to two years, then the prognosis must be carefully guarded. The same is true of the persistence of cavitation. But even such observation and repeated reexamination should be checked against the evidence available by biochemical and blood examinations.

Recent work has shown that considerable help may be obtained from estimations of the ratio of lymphocytes to monocytes in the blood. There appears to exist a reciprocal relationship between these two types of cell, a rise in the lymphocytes accompanying a fall in the monocytes, and *vice versa*. If the epithelioid and giant cells of the tubercle system are derived from the circulating monocytes it is easy to believe that a spread of the disease, accompanied by increase in tissue monocytes, may be reflected in the blood stream at the expense of the lymphocytes. This ratio may not run parallel with the Arneth index or the red cell sedimentation rate, these two tests representing different phases of blood stream activity.

Tomography in Pulmonary Disease.

I wish now to discuss a comparatively recent development in radiography, that is, tomography. I was introduced to this method of taking incision pictures while working in Germany in 1935, and have been using a "tomograph" since that time. McDougall[8] has described the machine and the principles of working. Essentially the method is as follows.

The tube and the film are arranged so that they can revolve on a vertically placed axis around a variable point. Mechanical adjustments may be made so that the travel of the film is accurately reciprocal to that of the tube when considered in relation to a plane which is parallel to the surface of the film and at a definite distance above it, that is, nearer to the focal spot of the tube. With a patient lying prone above the film, this plane will traverse a certain section of the thorax. During the exposure both film and tube are in motion. All thoracic details related to structures above and below the chosen plane are blurred by the motion produced. But details related to structures in this plane are not blurred because the motion of tube and film are accurately compensated. We thus obtain an "incisional" radiograph.

I was introduced to this apparatus by Chaoul[9] and Grossman, when visiting the Charite Hospital in Berlin. Chaoul and Grossman have both contributed papers on the results obtained by this method. I shall show you several films taken by my own staff with this apparatus and shall indicate the usefulness of the method in my own limited experience.

It would appear that a new field of radiological research has been opened up which promises to add considerably to our knowledge of disease, especially thoracic disease.

I have not yet examined patients with massive pulmonary collapse by this method. Woodburn Morison, to whom I am greatly indebted for much stimulating help in this matter, has put forward the view that the myo-elastic tissue in the bronchopulmonary tree is at first relaxed and then goes into spasm, actively expelling air from the lung, this factor, *plus* secretion in the tubes, being responsible for the resulting atelectasis. I feel, however, that Miller's suggestion that there may be mechanical kinking of the bronchus should be carefully investigated by the new tomographic method,

Using the machine, one can delineate the course of the bronchi even when the lung appears in the ordinary film to be uniformly opaque (see Figures V, VI and VII).

Chaoul, in a personal communication, has supplied me with details of the anatomical basis of pulmonary tomography. This fundamental change in technique produces an entirely new type of film, and a knowledge of the normal appearances is necessary for the interpretation of pathological conditions. Tomography has confirmed the generally accepted view that the pattern recorded in films is mainly vascular.

The Arteries of the Lung.

The pulmonary artery, originating from the *conus arteriosus*, runs at first practically horizontally towards the back. It then continues in a right-hand curve around the ascending aorta into the right lung as the right main branch, while the left main branch takes off almost at a right angle to this curve. The right pulmonary artery runs beneath the aortic arch and the bronchial fork towards the right side (as viewed in the frontal plane), crosses the right lower lobe bronchus and comes to lie between the eparterial and hyparterial bronchi. At the right hilum it generally divides into three branches. In the frontal plane we see, from above down, the eparterial bronchus, the main right pulmonary artery branch and the hyparterial bronchus. Below this again, and ventral thereto, are the pulmonary veins.

The left pulmonary artery runs in an oblique lateral direction at an angle of 45° to the frontal plane towards the back, crossing the left main bronchus before entering the hilum proper. It then divides so that the main continuation of the vessel is represented by the lower lobe branch, which curves caudally, producing a pronounced arch. The lobes of the lungs are supplied as follows:

1. Right upper lobe:
   A ventral, an apical and a dorsal branch.
2. Middle lobe:
   One vessel with a dorsal and two ventral branches.
3. Right lower lobe:
   Three superficial branches, namely: one descending ventrally, one descending medially, one descending dorsally.
   One small mediastinal branch.
4. Left upper lobe:
   One dorsal branch.
   One apical branch.
   One ventral branch.
5. Left lower lobe:
   Three superficial branches as on the right side, one descending ventrally, one descending medially and one descending dorsally.
   Again one small mediastinal branch.

The actual patterning of the lung vessels varies, but two main types of vessel exist:

1. The magistral type: Each lobe of the lung possesses one main vessel from which originate strong branches.

2. The scattered type: Several branches enter the lobe from the beginning and then branch out like a tree.

A combination of both the magistral and scattered types may exist (see Figure VII).

The Veins of the Lung.

The arrangement of the veins differs in the peripheral and central portions of the lungs. In the outer fields the veins run separately from the arteries; but in the inner lung fields, veins, arteries and bronchi meet. They congregate finally at the right and left hilar regions in the form of one upper and two lower groups of veins arranged ventrally and caudally to the main bronchus.

It is important when interpreting the tomogram to know the relation of these three main structures: artery, bronchus and vein. Fortunately a rule-of-thumb exists which enables us to memorize this relationship. If we draw a semicircle and trace this in a clockwise direction in the left lung and in an anti-clockwise direction in the right lung we find (provided that we begin medially in the upper lobe) that we encounter these structures always in the same order: artery, bronchus and vein, the bronchus lying then between artery and vein. In the tomogram the right hilum is well shown. Depending on the distance from the hilum that the incisional picture is taken, quite different structures of the lung system are recorded, three tomographic levels generally being sufficient to give an adequate record. Whereas in the hilum proper we see the larger trunk vessels, as we move further out these are replaced by an increasing number of cross-sections of smaller vessels, recognizable by their clear-cut circular shape. The interpretation of the left hilar shadow (the film being taken in the frontal plane) is rendered more difficult than the right because of the position of a large portion of the vessels immediately behind the heart shadow. The hilum itself appears alongside the left wall of the descending aorta. I have found this method of examination a very real help in pulmonary tuberculosis, bronchial carcinoma and obstruction, and bronchiectasis. Its sphere of usefulness in bone radiology is outside the range of the present lectures.

Bronchiectasis.

Bronchiectasis has been included in this series as a typical chronic non-tuberculous pulmonary lesion of comparatively frequent occurrence. In the evaluation of symptoms and signs in this condition cooperation between rhinologist, physician and radiologist is essential. I have for many years been sceptical as to the part played by nasal infection in the production of bronchiectasis and pulmonary abscess. In 1931 I reviewed a series of 112 proven cases of pulmonary abscess and bronchiectasis. Review of the past history in these cases showed that in only 32% was there a definite history of former broncho-pulmonary infection which could be interpreted as being actually causal. I confess that I am still unable to determine the ætiology of the condition in many cases that I see. Although bronchiectasis was described early in the

nineteenth century, it was not until chest radiography began to make strides about the time of the Great War that we made substantial progress, although a differentiation had been made between the "wet" and "dry" forms. Lipiodol was first used in these cases in Australia in 1925. This method of examination gave a great impetus to the study of the disease.

Miller[10] has drawn attention to the essential histological difference between the lungs of a young child and those of an adult. In the child the bronchioles terminate in relatively large alveoli, these being comparatively few in number. During infancy and early childhood new bronchi and alveoli arise from the peripheral part of the bronchial tree. The rate and degree of this further growth and differentiation vary in different parts of the lungs and in individuals, and many factors can interfere with this development. Assmann has contributed largely to our knowledge of lung pathology. Congenital bronchiectasis can occur in any part of the lung and is essentially an atrophic process. On the other hand, acquired bronchiectasis is mainly basal.

The Clinical Picture in Bronchiectasis.

Since the differentiation between "wet" and "dry" bronchiectasis was made, we have realized that symptoms depend largely on the degree of dryness of the bronchial walls. On the other hand, physical signs are determined largely by the depth of the lesion and the state of the lung parenchyma surrounding the affected bronchi. Hæmoptysis is the rule rather than the exception in this condition, and a sudden large hæmoptysis may be the first event to direct attention to the hitherto unsuspected lesion. The degree of toxicity present varies very widely, some patients showing no evidence of constitutional disturbance.

On the other hand, sweating, high temperature, tachycardia, prostration, indeed all the signs of severe toxæmia, may be present. There is often a steady waxing and waning of the toxæmia, this being governed by the ease with which the expectoration occurs. As secretion banks up, toxæmia increases. Once free drainage is reestablished, it steadily lessens. It is in the severely toxic cases that clubbing of the fingers is so pronounced. The odour of the sputum may show the same waxing and waning, this again depending largely on the efficiency of drainage. Physical examination rarely reveals the signs of cavitation. I have already discussed the remarkable inconstancy of the physical signs related to this morbid process. The adventitious sounds detected by stethoscopic examination vary widely from day to day and from patient to patient. In advanced cases with paroxysmal cough, clubbing of the fingers and copious malodorous sputum, the clinical diagnosis is rarely in doubt. I have seen several cases of dry bronchiectasis (*forme sèche hémoptysique*) in which practically the only evidence of disease was the occasional occurrence of hæmoptysis.

The Radiological Picture.

Radiography confirms the view that the congenital type is essentially atrophic. It generally assumes the "saccular" form, and there is thinning of the bronchial walls. In the acquired form, on the other hand, there is often thickening in this situation, and the dilatations are fusiform or cylindrical in type, although they may ultimately become saccular. In tomograms the thickening of the bronchial walls may be clearly shown. One is struck, too, by the crowded appearance of the bronchi.

The recognition of frank cavities in the plain film is an indication that the lesion is advanced and that ulceration is occurring in the bronchial walls. The translucency of the surrounding lung varies considerably. In the presence of active infection pneumonitis frequently occurs, with resultant clouding of the lung parenchyma. Atelectasis may develop, and in extreme cases the basal lobe may be represented by a small triangular area of dulness huddled close into the mediastinum. In the presence of such gross collapse there will be displacement of the mediastinal contents to the same side. In many cases, however, there is a quite indefinite appearance in films, unless recourse is had to lipiodol injection. The value of lipiodol as an aid to diagnosis is of course very great. To secure the optimum mapping in a film we should, as Blaubaum has pointed out, immediately precede the lipiodol instillation by bronchoscopic suction; otherwise retained secretion may prevent adequate entry of the oil into the affected area. By this method satisfactory and quite distinctive pictures may be secured.

The Influence of Cough in Bronchiectasis.

I cannot leave the subject of bronchiectasis without considering the relationship of coughing to the production of bronchial dilatation. Hedblom[11][12] refuses to admit that coughing plays any part in the production of bronchiectasis. Admitting that there is in this disease a progressive destruction of the musculo-elastic element of the bronchial walls, and even allowing for the rhythmic stretching and shortening that occur in ordinary respiration, it seems to me more likely that coughing does play a part. Coughing is really a very complex act. Essentially it is like the firing of a pop-gun. It is generally preceded by inspiratory distension of the thoracic cage; but the actual expulsion of air (the firing of the gun) always follows a compressive phase during which the intra-thoracic pressure rises. This is secured by compressing the thorax while the larynx is closed. The gun is now loaded. "Pulling the trigger" occurs when a further sudden and forceful compression occurs, with the glottis slightly opened. When we realize that a pressure of 100 millimetres of mercury may be built up during the compressive phase, it is easy to believe that the weakened areas in the bronchial wall may gradually give way in the presence of incessant coughing.

In the normal lung air enters the lung fields easily. All parts of the lung expand together, and the homogeneity of the lung elasticity ensures adequate support of any part in all three planes. But this is very different from the conditions obtaining in bronchiectasis. Here air entry is impeded in certain areas and the infiltration of other areas unbalances that essential uniformity of elasticity so necessary for the mutual support of one area by another. Undoubtedly there is abnormal drag in certain situations. The diaphragm acts as an adjuster of intrathoracic pressure; it opposes the action of the abdominal muscles, and by its sudden ascent "when the trigger is pulled" secures that sudden sharp rise in pressure so necessary for propulsion of sputum through the glottis. This sudden rise in pressure within the thorax obstructs the venous return. If the patient is suffering from headache, a paroxysm of coughing is exceedingly likely to aggravate it. Singers acquire a very sensitive control over the diaphragm, such coordination being necessary in the development of the vocal art. I admit that traction from fibrosis in the surrounding parenchyma may adversely affect the bronchiolar walls, but only when they have been damaged by disease processes.

Bronchial Carcinoma.

In recent years there has been considerable discussion as to whether there has been any increase in the incidence of bronchial carcinoma. It would appear that any such increase was more apparent than real. Boyd[13] classifies these tumours into three groups, according to their gross appearance:

1. Hilar tumours. These form rather more than 50% of all cases. The growth generally begins near the bifurcation of the trachea; but the rapid increase in size of the mediastinal glands may obscure the primary lesion (see Figure IX).
2. Miliary tumours. Here the appearance resembles that of secondary lung cancer, the primary nodule being somewhat similar to the secondary growths surrounding it.
3. Diffuse or pneumonic type of tumours. Here one or more lobes are converted into a pneumonic mass.

Symptoms are related to the growth of the tumour itself (this spread occurring by direct continuity or through the lymphatic and vascular systems) and to the obstructive effect produced in the bronchi, with resulting atelectasis and infection. Every large series of cases of bronchiectasis and pulmonary abscess contains some in which carcinoma as the causative agent has been overlooked. There are five main symptoms: cough, dyspnœa, pain, loss of weight and energy, and hæmoptysis. Davidson enumerates the following signs and symptoms: cyanosis, clubbing of the fingers, enlargement of superficial veins, irregularity of pupils or radial pulses, localized œdema, enlargement of glands above the clavicle and in the axilla, tenderness in the intercostal spaces, dulness of varying degree on percussion, diminution of breath sounds, a few generalized rhonchi, localized fine crepitations, pleural effusion.

S. O. Cowen[14] found that he could group his cases into a simple clinical classification:

1. Cases presenting obvious features of pulmonary disease:
   (a) With pleural effusion.
   (b) Without pleural effusion.
2. Cases in which the presenting symptoms are due to extrapulmonary metastases, the pulmonary symptoms being recessive.

Whether it is pain, hæmoptysis, cough or wasting which brings the patient for examination, the physical examination should be followed by the radiological. This demonstrates the nature and extent of the changes produced by the invasive process in lung and hilar structures. Involvement of nerves and great vessels is more common when the lesion is situated in the upper half of the thorax, pleural effusion, on the other hand, being more common when the lesion involves the lower half. Because of the collateral openings in the interalveolar septa, collapse, when it occurs, involves the whole lobe, such collapse diminishing the capacity of that hemithorax. The intercostal spaces become narrowed, the diaphragm is elevated, and the heart and other mediastinal contents move to that side. Whenever gross pleural effusion is discovered without displacement of the heart to the contralateral side, the diagnosis of bronchial carcinoma should be considered. Both artificial pneumothorax and lipiodol instillation may help in establishing the diagnosis. Tuberculosis may simulate carcinoma; but generally all doubt is removed by a repetition of both sputum and X ray examinations. Pneumonokoniosis is essentially a bilateral condition. Again I remind you that suppuration in a lung carcinoma may entirely mask the essential fact that such infection is secondary to the carcinoma.

Affections of the Heart.

So far our discussion has been limited to conditions primarily affecting the lungs. Let us now turn our attention more particularly to the heart, remembering that disease of the lung may produce marked secondary change in the heart.

Emphysema.

Pulmonary emphysema provides us with a good illustration of the fact that disease of the lungs may produce secondary changes in the heart. Parkinson and Hoyle[15] have recently reviewed the changes induced in the heart by pulmonary emphysema. For this purpose they investigated a series of 80 patients with hypertrophic emphysema. For a correct evaluation of the cardiac changes radiology is essential, and for the clinical diagnosis they did not accept any single criterion (such as the presence of a barrel-shaped chest), but relied upon a systematic conjunction of abnormal signs. Pulmonary hyperresonance, with prolongation of the expiratory murmur and distant heart sounds, occurred in nearly all. The radiological signs (increased lung translucency, widening of rib spaces, and flattening and depression of the

diaphragm) were present less constantly than the clinical signs. All films were taken at a six-foot skin-target distance at the end of inspiration. The size of the heart they measured by standard methods. They found that the transverse diameter of the heart was increased in 22 out of 50 cases. My own practice is to decide this question of cardiac enlargement by simple inspection of the film. You may say that this leaves the interpretation too much to the individual. After considerable experience in this work I feel that I can give a better opinion in this way than by using any arbitrary set of measurements. I shall return to this question again.

The ratio of internal chest diameter to horizontal heart measurement may be upset in pulmonary emphysema by increase in the transverse lung diameter.

Parkinson and Hoyle found that when change in the heart occurred in emphysema, the conus of the right ventricle suffered most. But this change in the outflow tract of the ventricle was not nearly as striking or as constant as that seen in the main stem and branches of the pulmonary artery. I have elsewhere discussed the composition of the hilar shadow as seen in tomographic films. In the main this is composed of the two branches of the pulmonary artery and their subdivisions, visualization on the right side being better than on the left. In emphysema these root shadows extend further into the lung fields. No enlargement of the pulmonary arc occurs. In a few cases the body of the right ventricle is enlarged. It is important to assess the size of the pulmonary arc. Mitral stenosis produces practically the same changes in the lung fields as emphysema; but here the pulmonary arc is enlarged. Both conditions represent an obstruction to the pulmonary flow. In one this occurs in the capillary bed of the lung; in the other, in the heart itself. In mitral stenosis we see also the enlargement of the "waist" of the heart, the normal flat or concave area on the left side spreading laterally. Convexity may even replace the normal concavity, this being due to enlargement of the left auricle. Reviewing the findings in their 80 cases, Parkinson and Hoyle agreed that the cardiac factor was quite unimportant until late in the disease. It is interesting to note that they found both the clinical and electrocardiographic evidence of cardiac involvement to be unreliable.

We must not forget that emphysema is very frequently complicated by associated cardio-vascular disease. When investigating the heart we must remember that it is only one part of the cardio-vascular tree. We really desire to know two things: what is the state of the myocardium and what is the state of the vascular system independently of the heart. Unfortunately there is no single sign by which we may test the state of the heart muscle. Undoubtedly the most important and constant of all the signs of myocardial damage is enlargement of the heart. The diagnosis of such enlargement must be checked radiographically. Of the symptoms of cardiac damage, dyspnœa unquestionably holds first place. If a patient has no dyspnœa and if his capacity for effort is not impaired, his myocardium is healthy.

Cardiac Enlargement.

Let us consider, then, this question of cardiac enlargement. We have two methods of study, the clinical and the radiographic. In the latter must be included Röntgen kymography, which I shall discuss in more detail at a later stage.

Bedford and Treadgold's statement that "enlargement of the heart is the most unequivocal sign of heart disease" is in most cases generally applicable.

Percussion is an ancient and honourable method of endeavouring to determine cardiac size. Some percuss lightly, some heavily. Others try both methods. Some patients are long and thin, others are short and fat, and we must not be disappointed if we discover that the personal factor in this method is very great. The simplest and best clinical method is to determine the position of the apex beat. Even when we allow for shifting of its position by such factors as scoliosis or the effect of a big meal, it is at least a helpful clinical guide. But the method is very often inexact, and in certain cases we get no information whatever from this traditional tapping of the chest.

Keith[16] has recently examined this question of the size and shape of the heart, and has described four types of heart. His investigation was limited to the examination of autopsy material, but he was of the opinion that there was a fair degree of agreement between the outline of the heart as seen at autopsy and that obtained in teleradiographs. The four types of normal heart described by him are as follow:

Type I. Inclined heart: This is in the main the normal heart of the anatomy books.
Type II. Horizontal heart: The angle between the long axis of the heart and the horizontal is decreased in comparison with Type I.
Type III. Globular heart: The apex is more rounded than in the other types.
Type IV. Square or conus heart.

It is necessary when examining radiographs to remember the variations that may occur in cardiac shape before deciding that any particular silhouette is abnormal.

We cannot during life weigh the heart or measure its cubic capacity; but we can estimate fairly accurately the relation of its size to body weight. Kymographic studies show that the left lower border (as seen in the antero-posterior film) is composed of the left ventricle. The similar area on the right side may be produced by either the right ventricle or the right auricle. The waist of the heart is delineated on the right side by the right auricle, and on the left by the appendage of the left auricle. Above this again are the pulmonary artery and the aorta. As we trace the left border from above downwards we see four convexities, these being due, in turn, to the descending part of

the aorta, the pulmonary artery, the left auricle and the left ventricle (see Figure XII). No constant position of the heart in the chest is found by screening. In people with short wide chests the apex is frequently tilted upwards after a full meal. The person with a long narrow chest has a heart with a long axis that is very nearly perpendicular. If we examine the patient with the fluoroscope while he is in the recumbent position the heart may appear to be rather larger than it really is, because of the elevation of the left hemi-diaphragm. In the plain film it is difficult to see the lower border of the heart; but the Röntgen kymogram enables this to be traced distally much further. I have already referred to the apparent enlargement which may be induced by scoliosis.

Dietlen[17] has carefully worked out the ratio of internal chest diameter to the horizontal heart measurement in individuals of all heights, weights and ages, and shows that this ratio is normally very little outside the figures 1·9 to 2·0, this being true from infancy to adult life.

Parkinson,[18] in his Lumleian Lectures for 1936, discussed the whole question of cardiac enlargement. Enlargement of the left auricle is seen most typically in mitral stenosis; but this enlargement occurs mainly posteriorly, so that the right oblique view is necessary for its demonstration on the film. Such posterior enlargement may cause this chamber to present to the right of the antero-posterior cardiac silhouette. Enlargement of the left ventricle is readily demonstrated, lesions of the aortic valve and hypertension being the common causes. Cardiac aneurysm occurring after coronary occlusion produces a characteristic appearance in films. Enlargement of the right auricle very rarely occurs as an isolated event. We have already discussed the relationship of enlargement of the right ventricle to pulmonary emphysema. Adhesive pericarditis is not a cause *per se* of cardiac enlargement. Dr. Paul White[19] reviewed this carefully in his Saint Cyres Lecture, his results being drawn from very extensive autopsy material. The condition is one which produces venous congestion by obstructing the venous return without inducing either cardiac failure or enlargement.

R. J. Wright-Smith[20] has carefully investigated the size of the heart after coronary occlusion. His conclusions were based upon the autopsy material from 496 cases of coronary obstruction examined by him at the Royal Melbourne Hospital. In more than half of these the condition was symptomless until the fatal attack. In only 79 was there a history of precordial pain, though dyspnœa was present in 108 cases. Males preponderated over females in the ratio of 399 to 96. The left coronary artery was involved in 437, the right in 9, and both in 49 cases. But this one very interesting fact emerged, that actual thrombosis occurred in only 45 out of the 495 cases, the occlusive process being gradually progressive and extraordinarily widespread.

These figures indicate the necessity of using the term "coronary thrombosis" rather sparingly. Obviously thrombosis is often presumed when the correct term is coronary "occlusion".

J. H. Palmer,[21] working with Parkinson, reviewed 200 cases of coronary occlusion which had been under observation for extended periods. The heart was enlarged in 64% of these. By a process of exclusion Palmer arrived at the conclusion that the coronary obstruction was the sole factor in producing enlargement in only 3·1%. He admits, however, that the total may have been as high as 8·6%.

If we review the emergent facts that coronary occlusion produces cardiac enlargement very infrequently and that in about half the cases coronary degeneration is symptomless until death occurs, we immediately see how difficult the detection of this disease becomes, even with electrocardiographic aid.

I believe that the Röntgen kymogram will be of great use in discovering and assessing cardiac damage due to this cause. It is clear that cardiac enlargement is produced much more frequently by resistance to the outflow of blood from the heart than by resistance to the flow of blood into its mural vessels.

The Recognition of Myocardial Disease.

How, then, are we to recognize the presence of myocardial damage? Like some hopeful punter who wants to know the prospects of his fancy at a race meeting, we judge on "past performances and present form". In other words, we consider the events in the life of the patient that are likely to have damaged his heart muscle in the past, and endeavour to discover how the heart reacts to an exercise test in the present. We know that the main causes of heart disease are congenital defect, acquired infection (as exemplified by rheumatism and syphilis), the development of arteriosclerosis and of hypertensive states, and toxic states, such as thyreotoxicosis. Bruce Perry,[22] reviewing 2,080 cases of heart disease, showed that rheumatism was to blame in 38%, syphilis in 4%, hypertension in 12·7%, thyreotoxicosis in 10·7% and arteriosclerosis in 19·1%. These figures agree very closely with those given in the annual report for 1934 of the chief medical officer of the Ministry of Health, of England. With these figures in mind, we can have a fair idea of the likelihood of any one factor producing damage in the life of the individual. The age of the patient furnishes an important clue, for rheumatism is essentially a disease of the young; in middle life hypertension asserts itself causatively; and in old age decrescent arteriosclerosis becomes of supreme importance. But whatever the cause and whatever the age at which damage reveals itself, the resulting symptoms are remarkably constant. I have stated that the most important sign is cardiac enlargement. Surely the most important symptom is dyspnœa, and against this one symptom all others should be checked. Whenever

the capacity for effort is shown to have become less, examination of the heart is indicated. Dyspnœa is so important a symptom that we are compelled to have a working knowledge of the conditions governing its production. The respiratory centre is stimulated whenever it suffers from oxygen lack or carbon dioxide excess. The slightest rise in the concentration of carbon dioxide in the blood of the medulla affects this centre. So will any change in the hydrogen ion concentration of the blood. All anoxæmia is not cardiac in origin. If the tension of oxygen in the inspired air is reduced the hæmoglobin will not be fully satisfied, and if there is an insufficient quantity of hæmoglobin to circulate, anæmic anoxæmia may be produced. If the blood is normal and fully saturated with oxygen but lessened in rate of flow, stagnant anoxæmia is produced. If the tissue cells are poisoned and unable to absorb completely the oxygen delivered to them, histotoxic anoxæmia occurs. The heart is mainly concerned with the third variety, that is, dyspnœa produced by circulatory stagnation. Many pulmonary conditions, such as emphysema or respiratory neurosis, may induce dyspnœa. It is curious to note how in the unguarded hours of sleep dyspnœa may be suddenly produced and the patient rudely awakened to find himself breathless.

Whenever the patient has dyspnœa due to myocardial damage it is a sign of the greatest importance and indicates that the cardiac reserve is lessened. The utmost care should be taken in eliciting the history of breathlessness on effort. The patient may explain away in a most ingenious manner that feeling of oppression or discomfort induced by hurrying. He will often direct your attention to a "cause" below the diaphragm. But if the symptoms, whatever they are, are accurately related to physical effort, it is likely that their origin will be discovered in pathological change above the diaphragm. Careful inspection should always be made of the superficial veins for evidence of overfilling, the result of congestive failure. Overfilling without failure may be produced by venous obstruction of extracardiac origin, as in adhesive pericarditis.

The routine use of the electrocardiogram will often give help. Changes in the form and take-off of the *T* waves have a definite diagnostic significance. But I confess that I have been disappointed in the help obtained from this method.

Wolferth and Wood[23] have used chest leads extensively in this disease, and it would appear that a Lead IV (a tracing taken with the right arm electrode on the chest wall over the fourth left interspace, and the left arm electrode on the left leg) will give more information than the routine use of Leads I, II and III alone. This lead, however, gives a tracing which shows inversion of the waves as judged by ordinary standards. If the left arm electrode is placed anteriorly over the ventricles, and the right arm electrode posteriorly, the tracing conforms to the usual types and inversion is avoided.

When this latter method of obtaining Lead IV records (left arm electrode anteriorly, right arm lead posteriorly) is used, the *P* wave is upright and of smaller excursion than in the limb leads. The *R-S* complex, on the other hand, shows a wider swing, this being diphasic. The initial deflection is positive, the second negative, the two being of equal excursion. The *T* wave is positive and has a large amplitude, even up to ten millimetres. The *R-T* segment is short, and may, in the normal, take off slightly above or below the isoelectric line.

Willcox and Lovibond[24] took Lead IV tracings in 40 cases during or soon after typical attacks of coronary thrombosis. In 20 of these cases the *T* wave in Lead I was abnormal, and in all 20, Lead IV was abnormal. At certain times Lead IV alone was abnormal in seven cases. In 15 cases the *T* wave in Lead III was abnormal, and in five others the curves were atypical. When the *T* wave in Lead I is abnormal the changes in Lead IV are the same as in Lead I, often in an exaggerated form. Where the *T* wave was abnormal in Lead III, the tracing in Lead IV was abnormal in 10 out of a total of 15; but in no single case were the changes more evident than in standard leads. When the fourth lead was modified it resembled Lead I.

If, as is now generally considered, the *T* I type indicates anterior infarction and the *T* III type a posterior lesion, we may, by use of the kymographic method, in association with the electrocardiogram, be able to localize the actual area of infarction. I shall discuss this further when considering Röntgen kymography in detail.

If it be true that cardiac enlargement is the most important sign of cardiac disease, it is similarly true that it furnishes a most reliable basis for prognosis. Grant[25] came to this conclusion after carefully analysing (over a period of ten years) the after-histories of 1,000 men suffering from cardiac disease.

Cardiac Murmurs and Arrhythmias.

It is well to remember that a small valvular defect may cause a loud murmur and that a large defect may cause none at all. Diastolic murmurs are of greater significance than systolic murmurs. At the apex they generally indicate mitral stenosis and at the base of the heart aortic incompetence. Aortic regurgitation in young people is often rheumatic in origin. In middle age we think of syphilis; but in later life it is generally part of an atheromatous process. Aortic stenosis is, of course, relatively uncommon.

In analysing arrhythmias the electrocardiograph is of the greatest possible help. The same is true of conduction defects. I would remind you that a conduction defect is often merely the index of much more widespread cardiac damage.

Recently, Cooper[26] has examined by radiography and electrocardiography a series of athletes before, during and after exercise. Without exception the

size of the heart was less after exertion than before, the mean reduction in the area of the heart shadow, as estimated by the planimeter, being 6·3%. The maximum reduction noted was 13·2%. These figures agree with those given by other workers. A slight increase in the transverse diameter may occur during exercise, this being replaced by reduction in size immediately the effort ceases. Such a decrease represents a diminution of the total quantity of blood traversing the heart, both as regards the chambers and the mural vessels. During effort the venous return is high, and for the size of the heart to remain unaltered the minute volume output must be the same as the intake. Obviously the normal heart can cope with the largest intake delivered to it during heavy effort. Cooper's electrocardiographic studies showed a large amplitude in the ventricular deviations. He was particularly struck by the size of the *T* wave in these athletes. During any lengthy period of training this may increase and both the *P-R* and the *R-T* interval may shorten during effort. During effort there may be a high take-off of the *T* wave, but when the effort ceases it falls to a position nearer the isoelectric line. The amplitude of the *Q R S* complex may increase slightly during effort, this change persisting for a short time after the cessation of effort.

These findings agree with the results of kymographic study. They indicate that under a small stress the heart responds largely by increase of the amplitude of systole, but under severe stress by acceleration of rate. The heart which has not been physically trained responds to stress chiefly by acceleration; but the trained heart has a greater increase of amplitude.

During effort the individual switches over from "peace economy" to "war economy" and from vagotonia to sympatheticotonia.

Röntgen Kymography.

I wish now to show you some of the results I have obtained by Röntgen kymography and to discuss generally the field opening up with it in the study of cardiac disease. This instrument records in an X ray film the amplitude of the excursion of the heart borders during two or more full cardiac cycles, this being governed by the setting of the instrument. The X ray beam first passes through the patient and then through narrow horizontal slits in a stationary lead grid. The film is kept in motion at a uniform speed in a direction at right angles to the line of the slits throughout the whole exposure. The pencil of light passing through the slits is modulated by the movement of the heart border and picked up in the form of a curve by the moving film. The differences in the amplitude and timing of the contractions of auricles, ventricles and great vessels are then shown in the curves composing the several portions of the cardiac silhouette. The part played by individual structures in the formation of the silhouette can be recognized and their resulting wave forms analysed. The postero-anterior silhouette is most commonly employed. In this form, beginning with the aortic knuckle on the left side, we see a quick outward thrust during systole. Below this are the waves produced by the pulmonary artery, and below these again those of the left auricular appendage. Systole is here represented by the trough of the wave. Below this again is the record of the left ventricle. As we ascend on the right side we see, in order, the right ventricular and the right auricular record. Above this again there is an area with very little movement, produced by the superior *vena cava*. If, on the other hand, this portion is produced by the right border of the ascending aorta, there is an active wave form due to aortic movement. In dextrocardia the position of the heart is reversed

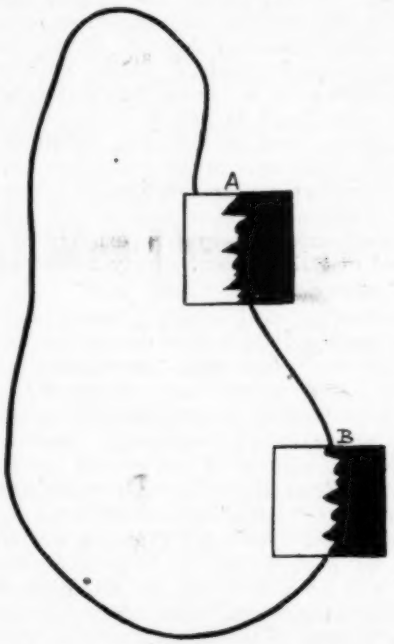

Figure XVI.

Diagrammatic reproduction of cardiac kymogram, for comparison with Figure XII. The tracing of the cardiac silhouette is from the teleroentgenograph. Each square represents the wave form in that portion of the heart. The square has been enlarged four times, so that the wave form (and consequently the amplitude of movement) is increased four times. A = auricle, B = ventricle.

and the movements of the chambers and great vessels are exactly the same as in the normal heart. If we are fortunate enough to record a ventricular extrasystole, a striking picture is obtained, showing one small wave followed by a large one, this resulting from the over-distension of the ventricle, the prolonged filling being recorded as a diastolic plateau. This extrasystole may, of course, not be recorded in the aortic silhouette. Certain technicalities must be observed. We select a speed of grid which will give a clear-cut picture covering two or three cardiac cycles. Faber and Kjaergaard[27] have recorded their results in the

use of this method. Each region of the heart has its characteristic curve.

Ventricular Waves.

The left ventricle produces strong mortise-chisel wave forms in which an upper oblique limb represents diastole, and the lower, almost horizontal limb, systole. At the apex the curves are roundish, owing to the up-and-down component of the movement at the apex. The amplitude of the waves varies a good deal. Their average is about seven or eight millimetres. Two types of movement are described by Kirch:[28] Type I, in which the waves are more powerful at the apex than around the base of the heart (this is the common form in healthy adults); Type II, in which the waves are more powerful at the base than at the apex. The occurrence of Type II is generally taken as a sign of lowered function of the heart.

Generally the outflow tract at the base of the heart undergoes dilatation earlier than the inflow tract (the apex region). But Type I is not always indicative of the presence of a healthy heart. The tracing of the right ventricle closely resembles that of the left.

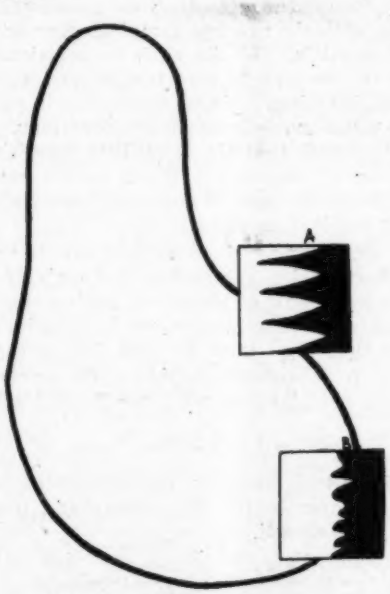

Figure XVII.

Diagrammatic reproduction of cardiac kymogram for comparison with Figure XIII. The tracing of the silhouette and the squares are explained in the legend to Figure XVI.

Organic lesions of the myocardium produce distinct changes in the wave forms. Myocardial degeneration may cause progressive reduction in the amplitude of the wave, with associated irregularities. The clear-cut pattern may be lost and smaller indentations and irregularities become superimposed upon or replace the normal wave form (see Figures XII and XIII). I have checked several such records against the clinical and electrocardiographic findings and have found them to tally. A great deal of work remains to be done. When actual cardiac failure exists, the excursion is grossly reduced, the waves being smaller and more ragged (see Figures XI and XIII).

As a heart recovers, Type I waves may replace Type II. The majority of organic lesions produce Type II movements. While the presence of this type of wave does not constitute an absolutely sure sign of poor heart function, lack of movements in a large portion of the ventricle certainly indicates serious myocardial disease. In one case recently I was able to observe progressive deterioration which preceded death from cardiac infarction. In three cases I have been able to demonstrate an infarcted area as a relatively motionless area, simply "riding" with the general positional displacement of the ventricle. In all three the occlusion was presumably in the descending branch of the left coronary artery.

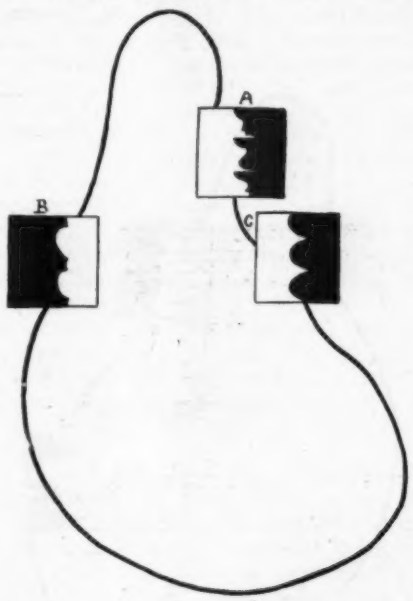

Figure XVIII.

Diagrammatic reproduction of cardiac kymogram for comparison with Figure XIV. A = aorta, B and C = right and left auricles.

Auricular Wave Forms.

The auricles are marginal only over a small area. Here we see closely packed double waves produced partly by contraction of the auricle, partly by the positional displacement resulting from the lateral-medial movement of the ventricles. A good deal of the right lower border of the silhouette may be due to the right ventricle. Enlargement of the left auricle may produce an extension of this double wave area. The auricle may, however, enlarge posteriorly, in which case such extension is not shown. In these cases the enlarged auricle is displaced posteriorly by the right ventricle and the pulmonary artery. Enlargement of the right auricle

may produce an upward shift of the double wave area on the right side.

Kymography in Mitral Stenosis.

In mitral stenosis the loss of the "waist" of the heart in the silhouette is apparent, this normally being well shown (see Figures XIV and XV). We can easily distinguish between the waves of the pulmonary artery and the left auricle. In a simple film these chambers are often very difficult to differentiate. In mitral stenosis we may find: (i) dilatation of the left auricle only, (ii) dilatation of the pulmonary artery only, (iii) dilatation of both. As long as the heart is compensated, Type I movements generally occur. If impairment of the right ventricular waves occurs, this event is generally preceded by dilatation of the chambers.

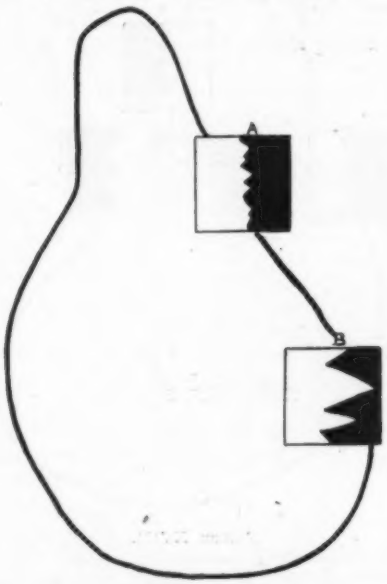

Figure XIX.

Diagrammatic reproduction of cardiac kymogram, for comparison with Figure XV. The tracing of the silhouette and the squares are explained in the legend to Figure XVI.

Kymography in Aortic Valve Disease.

If there is aortic stenosis the aortic movements are minimal, even in the absence of sclerosis of the aortic wall. With regurgitation, however, the aortic waves are long and pointed. The amplitude may be greatly increased, even up to 18 millimetres. There is associated enlargement of the left ventricle, with increased excursion in this section. It would appear that the movements of the aorta depend upon the condition of the valve, the state of the ventricle, and the elasticity of the aortic wall.

The Proximal Parts of the Aorta and Pulmonary Artery.

The proximal parts of the aorta and pulmonary artery normally produce mortise-chisel-formed waves, upside-down as compared with those of the ventricle. Here the almost horizontal limb corresponds to sudden distension of the aorta, the more oblique limb coinciding with the slower recoil movement of diastole. The amplitude of these waves varies. An average for the aorta is four millimetres, and for the pulmonary artery two to three millimetres. The right border of the ascending aorta is often concealed by other structures. Weltz[29] regards the movement of the ascending aorta is being summative, the result of the addition to the aortic component of a transmitted ventricular component.

The descending aorta has very little movement. This agrees with the observation of E. S. J. King,[30] who noted during operation for the excision of œsophageal cancer that he could feel with his hand no definite pulsation in the descending aorta.

Kymography in Aortic Disease.

High blood pressure produces no change in the wave form of the aorta. In arteriosclerosis we see, in addition to the lengthening often demonstrable in simple films, a positional straightening of the aorta during systole. This has been compared with the change which occurs in a garden hose as water is suddenly forced through it. This positional change contrasts with the expansive motion seen in certain cases of aortitis. If the shift is positional, both sides of the vessel are displaced simultaneously in the same direction. If the movement is pulsatory, opposite sides move in opposite directions. It will be remembered that in syphilitic aortitis great destruction of the elastic fibres of the aorta may occur. The occurrence of such large expansive wave forms is easily understood.

When describing the mechanical events occurring in the chest during respiration I drew attention to the downward pull of the aorta during inspiration. To avoid such respiratory aortic movement it is essential that the breath be held during the taking of the film. The wave forms of the aorta should always be checked against those of the ventricle.

Summary and Conclusions.

1. The attitude towards clinical and instrumental methods of examination in cardiac and pulmonary disease is discussed.

2. Consideration is given to the structural changes in the heart and great vessels in certain pulmonary and cardiac lesions, and attention is drawn to the limitations attaching to our methods of assessing them.

3. Some of the possibilities for more accurate examination by the newer methods of tomography and kymography are reviewed.

Acknowledgements.

I should like to record my thanks to Professor H. Chaoul and Dr. Pleikart Stumpf[31] for personal communications concerning tomography and kymography respectively; to Professor Woodburn Morison for much stimulating help; to my col-

league, Dr. Keith Hallam, for revising the proofs; to my senior technician, Mr. M. Tivendale, for the production of records and films. Some of the lantern slides were prepared by Kodak (Australasia) Proprietary Limited.

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SUPPURATIVE CONDITIONS OF THE LUNG AND THEIR TREATMENT, WITH SPECIAL REFERENCE TO ULTRA-SHORT-WAVE THERAPY.[1]

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SUPPURATIVE conditions of the lung have been frequently discussed in the last few years. The great improvements in diagnosis due to radiology, to the use of lipiodol and to bronchoscopy are perhaps the main reason for this. In spite of the development of thoracic surgery, advances in treatment have lagged behind. From the very nature of the lesions that fall into the category of pulmonary suppuration, and from the variability of their course, it is not surprising that there is still a great lack of unanimity not only as to the indications for treatment of different types, but amongst medical men in consultation over the same case. (Since this paper was written the subject has again been discussed at the annual meeting of the British Medical Association at Belfast, *vide The British Medical Journal*, August 14, 1937, page 332, and again considerably divergent views were expressed. This would seem to bear out the argument in the next paragraph.)

It behoves us, therefore, to give our close attention to any method that holds out hope of improving the results. Evidence is slowly accumulating that, with ultra-short-wave therapy, cures are being obtained that could not be expected from other methods of treatment.

The material and X ray photographs on which this address is based have come almost entirely from the Royal Chest Hospital, London, and from the University Medical Clinic (Ludolph Krehl Klinik), Heidelberg. To the staffs of these institutions my indebtedness is freely acknowledged, not alone on this account, but also for their inspiring teaching. Should the presentation be somewhat desultory in character, with a lack of systematic treatment of such points as statistics, ætiology, pathology and so on, it is pleaded that there is so much ground to cover and that these aspects have been discussed in easily available papers such as Maxwell's[(1)] admirable study, and in this country by Cooper[(2)] and Fitts.[(3)]

Concerning the ætiology of bronchiectasis nothing new is offered, but the importance of bronchopneumonia in children—and, indeed, in adults—and the necessity for appreciating its possible dire effects must be once more stressed. Let us now consider the more important suppurative conditions.

Lung Abscess.

The fatal multiple abscesses of pyæmic states will not be discussed here, and tuberculous conditions will likewise be excluded.

Maxwell[(1)] defines a lung abscess as "non-tuberculous suppuration, with cavitation, occurring in the

[1] Read at a meeting of the Western Australian Branch of the British Medical Association on September 15, 1937.

lung tissue". Pneumonitis is a very useful term to apply in those cases which have apparently not progressed to a stage of breaking down and cavitation; and, indeed, a number seem to resolve without radiological evidence of this. Pneumonitis is a word now frequently used by clinicians and radiologists alike (Kerley[4]). Failing resolution, cavitation sooner or later takes place, but it may be long delayed.

Cooper's[2] definition, "a localized suppurative process terminating in cavitation", embraces both stages, but, as will be seen, the retention of the term pneumonitis is desirable. The impression is strong that ultra-short-wave therapy can often clear up pneumonitis before a cavity has formed, or at least before one is revealed by X ray examination. So strongly is this impression gaining ground that it is becoming less and less likely that many institutions will attempt to treat a series of controlled cases by depriving controls of the benefits of this treatment in order to try and prove the *post hoc* as opposed to the *propter hoc* factor. The size of such an investigation will be obvious; so for the present it must remain a question of impressions, and I hope to offer some evidence in support of them. Large abscess cavities, too, have now been noted many times to disappear.

It should perhaps be mentioned that the recent development in Germany of radiography of different layers of the lung, the so-called *Schichtaufnahmen*, may reveal cavities invisible in ordinary films. Also, as Price Thomas[5] points out, unless air has got into the cavity, there is no fluid level and it may be missed. This is especially likely in the closed abscess. In the fortunately rare cases in which the infection is due to gas-forming organisms, a cavity with a well marked fluid level may occur independently of air from without; so lack of radiological evidence of a cavity does not mean that there cannot be one there.

Pneumonitis is by no means uncommon surrounding areas of bronchiectasis and malignant growths. In addition to pre-abscess pneumonitis, flare-ups may occur after an abscess. Pneumonitis or an abscess associated with carcinoma may be extremely difficult to diagnose from the recoverable condition alone. Cervical and axillary glands and a recurrent laryngeal or phrenic paralysis should always be looked for, and may be diagnostic; such cases will be illustrated tonight. Lipiodol may reveal bronchial obstruction, and, of course, bronchoscopy may clinch the diagnosis. Other points helpful radiologically are discussed by Kerley.[4] At the Royal Chest Hospital, Dr. Schuster has found carcinoma cells in the sputum in many cases in which the diagnosis has been confirmed.

Single abscesses, again according to Maxwell,[1] may be classified as follows:

Unilocular	Hilar	(*a*) Open to	Bronchus.
	Central		Pleura.
Multilocular	Peripheral	(*b*) Closed	
	Lobar		

Ætiology.

I do not propose, for the reasons mentioned, to give a list of the possible causes of lung abscess, or to discuss the arguments for aspiration, embolism *et cetera*, and the bacteriology of lung abscess.

Symptoms.

At one end of the scale of symptoms we have the acutely ill patient with severe toxæmia and foul odour, who never looks like getting better; such as these are regarded as cases of gangrene. Many prefer to reserve this term for those cases in which the condition is brought about by definite obstruction to the blood supply, gangrene of the lung thus being brought into line with gangrene in other situations. It matters not which term is used.

At the other end of the scale—and this includes many of the patients with pneumonitis—the clinical picture may simulate any subacute or chronic pulmonary condition, and these are often erroneously diagnosed as suffering from phthisis. The diagnosis after X ray examination may not be easy. The sputum may not be above one or two ounces daily, even after apparent drainage into a bronchus, and it is by no means always foul, although the breath may be offensive. (The foul odour, when present, is usually ascribed to spirochætes and anaerobic organisms.) Nevertheless, the risk of acute exacerbation and of complications such as cerebral abscess is a real one as long as the condition remains. Spontaneous cure may follow rupture into a bronchus with disappearance of the cavity, or the cavity may become chronic and thick-walled. A secondary bronchiectasis may develop. Symptoms such as hæmoptysis and clubbing of the fingers (and toes) are well known.

Signs.

The importance of good X ray photographs—a lateral view being essential for localization—has been as repeatedly stressed as the unreliability of physical signs as a means of diagnosis. This point cannot be further elaborated here, except by the statement that the chest physician himself should have a good knowledge of chest radiology; and this does not mean that the unbiased reports of his radiological colleague are superfluous.

Diagnosis.

The diagnosis of lung abscess is well discussed in the papers quoted. It goes without saying that the clinical evidence must be carefully sifted. The history is of great importance; X ray and sputum examinations are indispensable. One sees X ray photographs in which pulmonary tuberculosis cannot be excluded. When, however, the sputum, in spite of being plentiful and purulent, is repeatedly "negative" for the tubercle bacillus, then this is a valuable diagnostic point against pulmonary tuberculosis. More than one such patient has found his way to a sanatorium, especially when the physical signs, as they may, have also suggested a diagnosis of phthisis. Two X ray photographs will be shown

in which, from the appearance at the right apex, pulmonary tuberculosis was at least a possibility; yet the diagnoses were respectively lung abscess and pneumonitis surrounding a localized bronchiectasis, the so-called bronchiectatic abscess.

The localized bronchiectasis in this case was thought to be due to an old healed tuberculous lesion —which can, of course, produce it. The marked deviation of the trachea to the affected side in this case is noteworthy, and in such a situation this is usually due to fibrous tissue of tuberculous origin. Yet the man was not suffering from pulmonary tuberculosis. Repeatedly "negative" sputum was obtained, and lipiodol then revealed the state of affairs.

The pneumonitis which progressed to multilocular cavitation cleared up with short-wave therapy. Moreover, persistent pain in the right shoulder region, doubtless due to apical adhesions and perhaps to some fresh localized pleurisy, also disappeared after several applications of this treatment. Of course, the patient was left with the right upper lobe bronchiectasis, which, however, had not troubled him previous to the complication. The patient suffering from lung abscess also left hospital apparently cured. It is now well known that, whereas in abscess owing to bronchial obstruction from œdema or from granulation tissue, lipiodol will rarely enter the region involved, in the bronchiectatic abscess it does so. In patients with carcinoma a bronchus may be characteristically obstructed by the growth. All these points are to be illustrated later.

A basal tuberculosis may sometimes cause difficulty. For some reason collapse of the affected lobe is not uncommon in these cases, when the diagnosis also from carcinoma and bronchiectasis may not be easy. The sputum examination may settle the matter. If not, other investigations will have to be undertaken. It is to be remembered that rarely in carcinoma the sputum may be found to contain tubercle bacilli. Hydatid disease and amœbiasis will be borne in mind, especially in countries where they occur. It will be remembered that rarer conditions, such as undulant fever, psittacosis and certain paratyphoid infections, may cause pulmonary symptoms suggesting suppuration, although in two patients suffering from paratyphoid the cough was nonproductive and the symptoms and signs were those of an atypical bronchopneumonia (Maxwell[6]). However, in atypical bronchopneumonia it is a good rule to think of a general infection and pulmonary suppuration as well as of tuberculosis. Schliephake[7] cites two patients with Malta fever who did in fact have abscesses, and were successfully treated.

Bronchiectasis.

Lipiodol is of paramount diagnostic importance in bronchiectasis. Many have their favourite method of introducing it. At the Royal Chest Hospital the laryngeal catheter passed through the nose has given almost uniformly good results, and even fairly young children, when their confidence is gained, can be dealt with in this way. When it is desired merely to exclude a basal bronchiectasis, the method of dropping the lipiodol over the back of the tongue by means of a syringe and a laryngeal cannula is usually successful. Both these methods are preceded by the administration of cocaine. Puncture of the crico-thyreoid membrane has obvious objections.

As regards the ætiology of bronchiectasis, it is now agreed by most clinicians and pathologists that there is an antecedent bronchopneumonia in the great majority of cases. In children, even if the bronchopneumonia has not been diagnosed at the time, there is often a history of a severe of slowly recovered-from attack of one of the infectious diseases. The frequency of measles, pertussis and influenza in the past history, all of which, of course, are liable to cause severe respiratory infections, is everywhere noted.

Many observers in Australia hold the view that nasal sinusitis plays a large part in the ætiology. There seems little doubt that long continued infection of this kind has often been the forerunner of bronchiectasis in this country (Crisp and Gill[8]). This has also been the experience of Farmer and Hislop[9] at the Perth Hospital. In England and Europe the association is much less frequent, and the "secondary" type of bronchiectasis is seen much less commonly than that brought about by damage from a lower respiratory infection. When upper respiratory infection exists, especially infected adenoids or sinuses, the importance of its treatment is obvious.

The work of Blake and Cecil on the pneumonias would seem to go far towards explaining why bronchopneumonia and not lobar pneumonia is to be feared as a cause of the fibrosis that is the invariable accompaniment of bronchiectasis (Boyd[10]). A proper appreciation of the evolution of bronchiectasis from the stage where it threatens is of the greatest importance in pædiatrics and, indeed, in adult medicine too. Then will unresolved pneumonia or a slowly resolving respiratory affection in one of the diseases named be regarded as a warning of possible trouble to come. In this connexion the chapter on "the damaged lung of childhood", a term used by Rivière in Davidson's "Practical Manual of Diseases of the Chest",[11] is worthy to be read by all, and gives much food for thought. It is at this stage, where bronchiectasis seems to threaten, that one would like to see the cures. A long and careful convalescence at the seaside or in the country, nourishing food, breathing exercises and so on are rightly advised (Young[12]). What, in addition, can be done for these patients will be discussed when treatment is considered.

The later occurrence of bronchiectasis following the inhalation of foreign bodies, and resulting from malignant growths and chronic abscesses, is well known. Although bronchiectasis is classed among

the suppurative pulmonary conditions, from time to time patients are met with who have little or no sputum, who have not always a cough, but who sometimes have hæmoptysis, which may be very profuse. To this type of case the term *bronchiectasis hæmorrhagica sicca* is applied (Wall and Hoyle, 1933). Here again have mistaken diagnoses of phthisis been made.

Of the complications of bronchiectasis, pneumonitis has already been mentioned, and ordinary bronchopneumonia may occur. In children collapse of a lobe of a lung is fairly common and is seen in adults from time to time. It is still debated as to which comes first in certain cases, the collapse or the bronchiectasis, but I do not propose to go into the question here. In some cases all the evidence points to bronchial obstruction from a plug of inspissated mucus as the cause of the collapse. Although many of these patients are found to have a collapsed lobe on routine examination, in others pneumonitis may ensue and the child may be very ill. Such a case, with recovery after bronchoscopy, will be illustrated later. It was first thought that the child had a foreign body blocking a bronchus.

The diagnosis of collapse of a lobe is frequently made clinically nowadays, and often gives a characteristic X ray picture (Kerley[4]). It is extremely frequent in bronchial carcinoma, and unexplained collapse of a lobe or of the whole lung should always bring this possibility to mind. Other conditions associated with bronchiectasis have been briefly mentioned. A slide is to be shown of a patient with syphilitic fibrosis of the lung with bronchiectasis, independently diagnosed by my former chief, Dr. Maxwell, and by Dr. Peter Kerley on the peculiar and (to those who have seen them) rather characteristic X ray photograph. The response to the Wassermann test later proved to be "++++", and the patient improved considerably on receiving anti-syphilitic treatment.

Congenital Cystic Lung.

The question of congenital bronchiectasis and of the so-called congenital cystic lung is an interesting one. Much remains to be learned of these puzzling conditions. It is rather remarkable to think that some of these patients live in good or fair health to comparative old age. They are, however, very liable to inflammatory and suppurative complications.

Treatment.

What is to be said on the question of treatment will be mainly about the ordinary lung abscess, although bronchiectasis comes in for important mention. With regard to abscess, there are those who believe improved results will come from earlier operation and those who favour prolonging medical treatment. Into mortality statistics I do not propose to enter. It is but fair to say that most surgeons believe in a thorough trial of medical treatment, and that most physicians who see their patient doing badly do not hesitate to call in a surgeon. In some of these cases earlier operation may be deemed to give the best chance, especially in peripheral abscesses and when bronchial drainage is poor or absent (Hunter[13]).

Every case should be dealt with on its merits, and, although no fixed time for medical treatment can be given, a period of six or eight weeks is often mentioned. With the new weapon of ultra-short-wave therapy, the number of those who favour its prolongation is increasing, especially in Germany. Thus, in Heidelberg, Fink and Dieker[14] state that further experience has shown that they at first erred in relinquishing short-wave therapy after about thirty treatments given daily or every second day. They now do not hesitate to continue for fifty, sixty or even more applications. It must not be thought that every patient requires such prolonged treatment, although this time would often compare favourably with that required for cure after operation or ordinary medical treatment. Spontaneous cure, as will be illustrated, can of course take place, but it can never be anticipated.

Medical Treatment.—The various expectorants and deodorants are of use symptomatically, but they have little effect on the disease. The rationale of the use of "Novarsenobillon" seems well founded, but the results are disappointing. The same applies to the exhibition, in non-amœbic cases, of emetine. Everyone is now seized with the importance of properly directed postural drainage. Even if it is not possible to follow the detailed directions of the late H. P. Nelson,[15] the patient can often cooperate with the clinician in finding which position produces the best result. The futility of upending a patient to drain an upper lobe bronchus is self-evident. Routine bronchoscopic examination at an early stage is always advisable if the patient's condition allows it, in order to exclude foreign bodies and newgrowths. But not all are in favour of its repeated use, believing that the results are not superior to those of postural drainage conscientiously carried out; and it may be very exhausting to the patient. Should bronchoscopic aspiration be doing good, it is worth repeating; if not, it is better suspended. Negus,[16] in subscribing to this view, has stated what he believes to be the indications.

It was after a thorough trial of these methods, say, for six or eight weeks, but often for a longer or shorter period, depending on the patient's condition, that other procedures began to be considered. Let us take some of these *seriatim*.

Artificial Pneumothorax.—Artificial pneumothorax may be a dangerous method of treatment, and should in general be condemned. It should never be induced unless the abscess is an open one draining into a bronchus, and unless it is deep seated. Even then it is risky. In the case of a peripherally placed abscess, to perform artificial pneumothorax is to invite disaster in the form of empyema. No apology is offered for quoting verbatim Price Thomas[5] in this regard:

ILLUSTRATIONS TO THE ARTICLE BY Dr. DOUGLAS J. THOMAS.

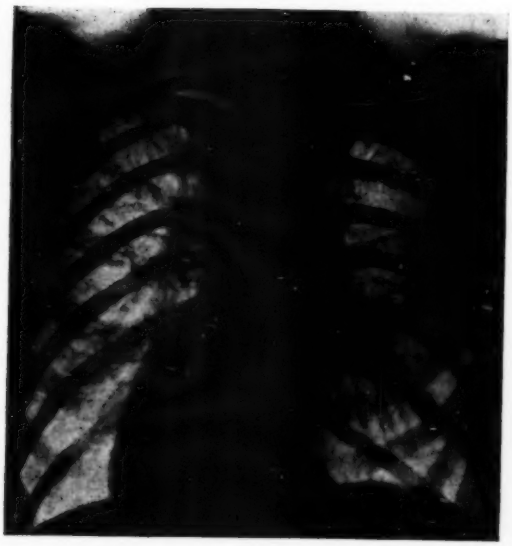

Figure I.

Pulmonary tuberculosis. Atelectatic fibrotic lung. Cavity right upper lobe. Trachea drawn considerably to this side. Calcified nodules left side.

Figure II.

Tomogram of condition shown in Figure I, showing the extreme tracheal deviation.

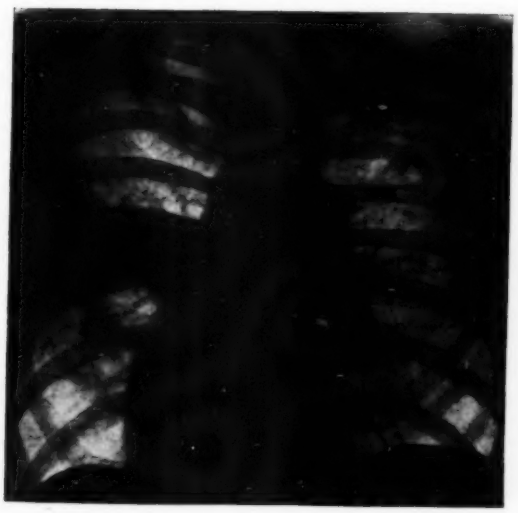

Figure III.

Pulmonary tuberculosis. Cavity right apex and consolidation near left hilum.

Figure IV.

Tomogram of condition shown in Figure II.

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FIGURE V.

Pulmonary tuberculosis. Right lung uniformly stippled. Dull left hemithorax.

FIGURE VI.

Tomogram of condition shown in Figure V, showing tracheal and mediastinal displacement, and gross pleural thickening at left base.

FIGURE VII.

Pulmonary tuberculosis. Tomogram, showing tracheal and mediastinal displacement, cavitation of the atelectatic right lung, and the extreme pleural thickening.

FIGURE VIII.

Pulmonary tuberculosis and silicosis. Tomogram. On the right side, projecting from the upper mediastinum, is a large rounded tumour with what appears to be an adhesion on its lateral aspect. Tomogram indicates that there are radiolucent areas in the general dulness of the tumour shadow. This is possibly a collapsed right middle lobe.

ILLUSTRATIONS TO THE ARTICLE BY Dr. DOUGLAS J. THOMAS.

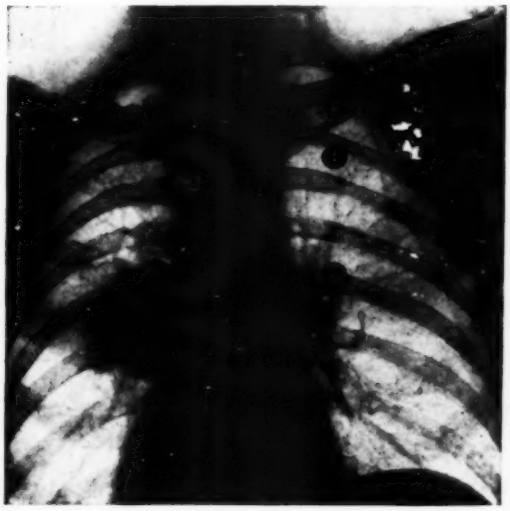

Figure IX.
Carcinoma of left main bronchus.

Figure X.
Tomogram of condition shown in Figure IX.

Figure XI.
Advanced myocardial degeneration, maximum at the apex of the left ventricle. At the base of the ventricle amplitude is slightly reduced, but at the apex movement is minimal. Secondary wave forms present.

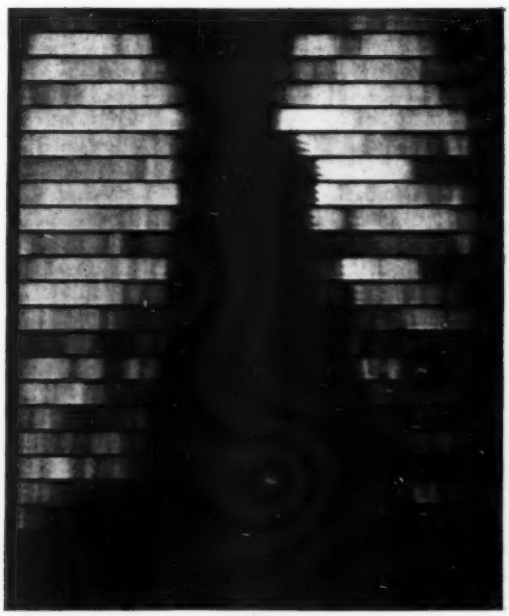

Figure XII.
Taken from a patient with *T* 1 type infarction. (Death has since occurred.) The extreme inefficiency of the cardiac muscle at apex of heart is well shown. For diagrammatic reproduction see Figure XVI.

ILLUSTRATIONS TO THE ARTICLE BY DR. DOUGLAS J. THOMAS.

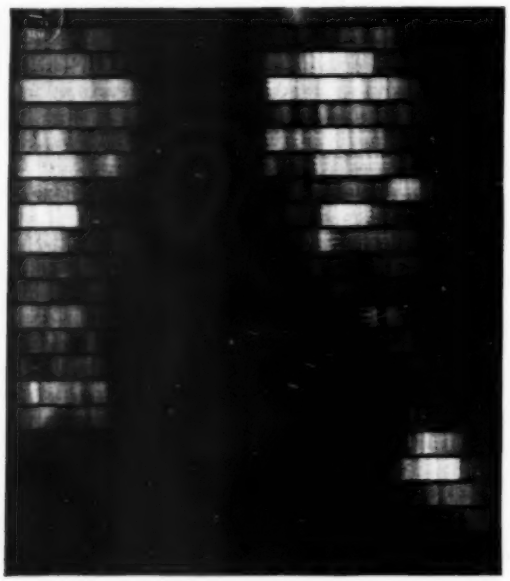

FIGURE XIII.

Myocardial degeneration of advanced degree. A high grade coronary degeneration is probably present, although no "thrombosis" has occurred. Movement at apex of left ventricle is minimal. For diagrammatic reproduction see Figure XVII.

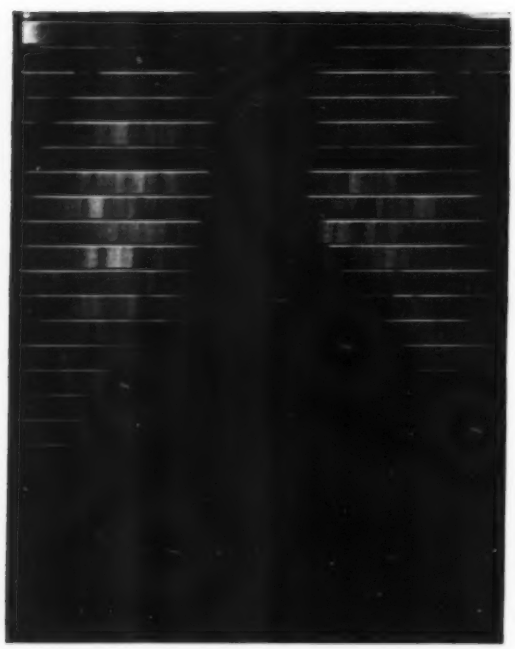

FIGURE XIV.

Mitral stenosis. Characteristic change in cardiac silhouette. Minimal cardiac movement. Systole is prolonged, the horizontal line normally seen being replaced by an oblique line because of the slower movement. For diagrammatic reproduction see Figure XVIII.

FIGURE XV.

Auricular fibrillation. Mitral stenosis. Minimal auricular movement only present. Ventricular wave form shows variation in amplitude and duration. For diagrammatic reproduction see Figure XIX.

This [empyema] may occur spontaneously or as the result of treatment. When it occurs spontaneously it is generally of gradual onset and consequently of limited extent, it being rare to meet with a complete pyothorax in this connexion. The occurrence of a spontaneous empyema does definitely increase the mortality, but not anything like to the extent that the empyema which occurs as the result of injudicious treatment does. The reason of the special seriousness of the latter type is probably its rapid onset; the sudden flooding of a normal pleural cavity with the pus from a ruptured abscess is identically the same as the rupture of an appendix abscess into a free abdomen. In each case the sub-serous lymphatics are in the optimum condition for the absorption of toxic products, and before the patient, who is already suffering from toxæmia, can put up any barrier of resistance the balance is turned against him. In those cases of gradual onset, on the other hand, the pleural and sub-pleural tissues gradually form a barrier of granulation tissue and hence absorption is decreased and the organism as a whole is capable of dealing with the new focus. It is this lack of appreciation between the modes of onset of empyema complicating abscess which leads to conflicting statements as to the prognostic significance of this complication.

Moreover, we do not know how the draining bronchus is situated with respect to the abscess cavity. The effect of artificial pneumothorax may be not to collapse the cavity at all, or, if it does, to kink the very bronchus that is draining it, thereby bringing about decreased retention and toxæmia. Should the patient, escaping the major disaster of empyema, get into this state, his condition may seem to demand immediate operation, but the surgeon loses what may be valuable time waiting for the lung to expand. Operation across a free pleural space will inevitably cause an empyema, even if the attempt at artificial pneumothorax did not. The use of the exploring needle in cases of suspected lung abscess is likewise to be classed as a dangerous practice.

Phrenicotomy and Phrenic Avulsion.—In view of the good results obtained in some cases of tuberculosis, phrenicotomy and phrenic avulsion have been carried out in suppuration of the lung. The results are usually disappointing and always uncertain, even in the basal abscesses in which they are mainly employed.

Major Surgical Procedures.—Major surgical procedures can be only briefly discussed here. Should operation be deemed necessary in the acute or subacute stage, most authorities are agreed that the two-stage drainage operation is the most suitable. The rationale and technique of this have often been described. In the more chronic cases, other procedures, such as thoracoplasty and *plombage*, aimed at securing collapse or partial collapse of the lung and its cavity, are sometimes practised. Here again the results are uncertain, although in a case of gross unilateral bronchiectasis, in which lobectomy was thought to be too great a risk, I saw a very good symptomatic, if not anatomical, result of the *plombage* operation.

For the chronic, thick-walled abscess, just as in cases of bronchiectasis confined to a lobe, the operation of lobectomy may have to be considered. The technique and the results of this procedure have greatly improved, but the mortality is still considerable. Simple drainage at this stage cannot be expected to cure.

As to the risks of the two-stage drainage operation, if the patient survives some of the immediate dangers inseparable from such a procedure, there are possible sequelæ which must be borne in mind when this is advised. These have been summarized by Schliephake;[17] and I now give a translation of the relevant passage from the article quoted:

For the patient not only does the danger of the operation play a part, but also other accompaniments which are bound up with it. In general, one has to allow for long drawn out after-treatment, which takes up many months, not seldom a whole year. For much of this time the patient is confined to bed, and as well as the high cost of the operation [*sic*] has that of a long stay in hospital, with its attendant expenses, to bear. Over and above this, in consequence of body weakness, a long convalescence is usually required before he can turn his thoughts towards a resumption of work. Nor is this all, for after such an operation a "cure with defect" is alone possible. The pleural adhesions and thickening that are actually desired by the operator remain for life. The severe attack on the thoracic wall and the often long-enduring open state of the wound bring with them anatomical and functional changes which cannot but handicap the patient more or less severely throughout his future existence, and which often reduce him to a state of crippledom.

The pain and invalidity caused by pleural adhesions in certain non-tuberculous conditions of the lung—not alone post-operative ones—will be referred to again.

Short-Wave Therapy.

Let us now consider short-wave therapy itself. Time permits of only a short account of its nature and basis, and practical work with the machine is worth much description. The average medical man is not a physicist, nor is it necessary to be one to appreciate the fundamentals. Electric waves having frequencies of ten to one hundred million oscillations per second are designated as ultra-short or short waves. As Schliephake[7] points out in the introduction to his book, this nomenclature may give rise to confusion with the terms mainly used in wireless telegraphy for waves the length of which may run into several kilometres. It is quite otherwise when the radiations of light and heat are compared with the short waves in question. It is incorrect, in this connexion, to speak of a modified or "ultra" diathermy. The principles are different, but it is the difference in action of the human organism and on human diseases which is all important; and the effects of ultra-short-wave therapy and of diathermy, both experimentally and in their action on human diseases, are quite distinct.

Now, wave-length is inversely proportioned to frequency, and it has been found convenient to speak in terms of the lesser figures. It is now, therefore, customary to speak of wave-lengths of under 100 metres as being short. In this sphere wave-lengths of over thirty metres are rarely used, so we may call those of from three to thirty metres ultra-short, or, more simply, short. It is the three to fifteen metres range that is mostly used in the treatment

of human beings. Compared to diathermy, which usually works on a wave-length of from three hundred to five hundred metres, a reliable short-wave therapy machine uses a wave-length within the limits quoted, it has a much higher output, it has undamped as opposed to damped oscillations, and it has a much more penetrating effect.

The current of diathermy obeys the laws of the conduction of electric currents in general, and it is subject to the same resistance (ohmic resistance). With the ultra-high-frequency current or, as it is preferably called, the ultra-short-wave current, these laws no longer hold good. The current flows through metal, but it flows through non-conductors, such as rubber, glass and even air, as well. To understand this one must start with the conception of a condensor, by which is here meant a structure consisting of two metal electrodes with non-conducting material of glass, rubber or air between them. This intervening area is termed the dielectric. A current, which must be alternating, is harnessed to this system, and the laws of electric resistance no longer obtain.

One speaks now of the capacity of the condensor, and of the resistance as "capacitative" resistance. The greater the capacity of the condensor, that is, the greater its property of absorbing electricity, the less is the capacitative resistance (Kowarschik[18]). For the rest, it must suffice to say that an essential part is the valve, which works on exactly the same principle as a radio-sender valve. Just as the valve type of sender has superseded the spark-gap apparatus for radio transmission, so, in the opinion of most authorities, is the valve type of high-frequency current for treating human beings superior to the spark-gap apparatus, such as diathermy. Progress in this domain has followed closely upon progress in radio transmission—another example of medicine profiting from advances in general science.

For practical purposes it is emphasized that the *Tieferwärmung,* or production of deep warmth, is the great advantage of short-wave therapy. This has been proved by Schliephake and other investigators, and it has been amply confirmed by results obtained on man. For details of these experiments, as well as for the action upon the blood corpuscles, the blood serum and other tissues, his book should be consulted. It is still debated whether, in addition, there is a further biological action, but this point need not detain us here.

There are a few important features in the technique, of which the distance of the electrodes from the skin over the area to be treated is paramount—a point first stressed by Schliephake. The reasons for the varying distances of the electrodes are well set out, with numerous diagrams, by Fritz and Schubart.[19] With proper technique in lung cases, the patient should have a mild but grateful feeling of warmth on the skin. In other conditions, as for example a carbuncle, one electrode can be brought nearer so that the heat is more concentrated on the spot desired.

To sum up, when deeper penetration is desired the electrodes are placed at a greater distance than for the treatment of a superficial lesion. Lung conditions are usually treated with a wave-length of six metres. Siemens's "Ultratherm" has this wave-length. In their more elaborate machine, the "Ultrapandoros", the wave-length can be regulated between three and fifteen metres. It is not yet proved that wave-lengths below six metres give better results, although the "Ultrapandoros" has a higher reserve of power. Each sitting varies from ten to twenty minutes, the latter time not often being exceeded. The treatment may be given daily at first, and then every second day. As mentioned before, those with experience in the treatment of lung abscess by this method have noted the inadvisability of stopping the treatment too soon.

What can we hope to achieve by this form of therapy? Schliephake[7] makes no extravagant claims touching all fields in which he used it. He quotes his failures as well as his successes. That many of the successes obtained in suppurative conditions of the lung could not have been expected of other methods is undoubted. Thus he reports twenty-five cases with twenty-three cures, the two failures probably being due to the presence of carcinoma in addition to abscess of the lung. It was my good fortune to be present at a clinical meeting in Heildelberg when X ray photographs from seven consecutive cases of lung abscess were shown, in which a cure had been effected by this treatment. Such an authority as the surgeon Kirschner, who was present, stated that he was greatly impressed by the results. Through the kindness of Professor Stein, Director of the Ludolph Krehl Klinik, and of Dr. Dieker, its radiologist, it is possible to show some of these X ray photographs tonight.

One patient seen after one or two treatments had a rise in temperature, with increased sputum and malaise, and the treatment was stopped. Schliephake has occasionally noticed this, as well as complaints of oppression and of mild dyspnœa. These he attributes to the temporary retention of the heat generated and to the pulmonary hyperæmia. None of these is an indication for stopping the treatment, but the field strength and the duration of each sitting should be reduced. In favourable cases the temperature gradually falls, the general condition improves, weight and appetite increase and the sputum decreases. Along with this is an improvement in the radiological picture.

I do not propose to discuss empyema, but it may be noted that Schliephake and others have had some excellent results in chronic cases with sinus formation, while acute cases have cleared up after one aspiration followed by short-wave therapy.

I had intended to say something of the treatment of bronchiectasis. Time, however, grows short, and recognized methods, including the wider employment of lobectomy, are well known. While it cannot be hoped that short-wave therapy will cure in an advanced case, even here great symptomatic relief has been reported. In other phases the treatment

has a very definite place, namely in "the damaged lung of childhood"—the potential or early bronchiectatic lung if you like—and in those established cases in which a pneumonitis develops surrounding an affected area. These conditions have already been mentioned. In the former condition ultra-short-wave therapy is routine treatment in the Children's Clinic at Heidelberg, where Frick, in demonstrating some cases early this year, reported excellent results. Likewise, adults with pneumonitis, with signs of delayed resolution following pneumonia, or with signs suggestive of pleural adhesions following an attack of bronchopneumonia, should receive this therapy.

The pain and disability that may follow operation on a lung abscess have been referred to. In bronchiectasis also pleural adhesions are extremely common. Anyone who has seen the trouble a surgeon may have with them at the operation of lobectomy will not fail to connect them with the patient's pain.

References to the good effect of ultra-short-wave therapy in many painful conditions are creeping into English medical literature (Balme[20]), and there is no doubt that it may afford great relief in painful pleural adhesions. In the same way anyone who has had to deal in practice with patients who have recovered from influenzal bronchopneumonia will have noted how frequent is a complaint of persistent pain. So it is as well to remember that in these conditions we may have to deal not with a pulmonary fibrosis alone, but with a pleuropulmonary fibrosis.

Summary.

1. The commoner types of lung suppuration and their diagnosis are outlined.

2. The use of the term "pneumonitis" is supported, and the conditions under which this occurs are discussed.

3. The importance of a correct appreciation of the pathology underlying the evolution of bronchiectasis from "the damaged lung of childhood" is stressed, as well as the significance of collapse of a lobe of the lung.

4. The dangers of artificial pneumothorax and of the exploring needle in lung abscess are detailed; and it has been deemed advisable to refer to the possible remote sequelæ in addition to the immediate risks of operation, although in some cases this may still have to be undertaken.

5. It follows that any more conservative method that promises improved results merits further study.

6. Attention is drawn to the good results that are being obtained in Germany with ultra-short-wave therapy, and to the increasing literature about it.

7. The nature and basis of this form of treatment are briefly discussed, with indications for its employment in such conditions as pneumonitis, lung abscess, unresolved pneumonia and the prebronchiectatic and the early bronchiectatic lung.

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DISORDERS OF THE PITUITARY GLAND IN RELATION TO CIRCULATORY AND METABOLIC DISTURBANCES: THE CLINICAL ASPECT.[1]

By D. W. Carmalt-Jones, D.M., F.R.C.P.,
Dunedin.

The disorders of the pituitary gland are very difficult clinical problems, for two reasons. First, the pituitary gland influences metabolism by its action upon the thyreoid, adrenal, insular and other glands; it is thought to produce hormones of large molecule which act upon these glands and stimulate them to produce their own secretions, thyroxin, adrenaline, insulin, and so on, which are of relatively small molecule, and some of which have been prepared synthetically. Pituitary disturbance will therefore appear clinically as Graves's disease or diabetes, and will be quite successfully treated by subtotal thyreoidectomy or by insulin injection. In the goitre clinic at Dunedin Hospital, although no one is satisfied that Graves's disease is primarily a thyreoid disorder, nothing has presented clinically to suggest pituitary disorder, and in the diabetic clinic the heading "Pituitary" is always left blank.

The second reason is that clinical lesions are rarely clear-cut and do not reproduce the pictures obtained experimentally. There is a number of pituitary structures in close anatomical and functional connexion—the eosinophile, basophile and chromophobe elements of the anterior lobe of the pituitary, the posterior lobe of the pituitary and the

[1] Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

hypothalamus—and it seldom occurs that a clinical lesion is limited precisely to any one of these.

No one will dispute the difficulty, and the following suggestion is no doubt much over-simplified; but as a general idea it may be taken that the eosinophile cells of the anterior lobe of the pituitary control growth, the basophile cells control glandular activity, and that the supraocular nuclei of the hypothalamus control water metabolism in close association with the posterior lobe of the pituitary. A fat-metabolizing hormone is also adumbrated, situated perhaps in the hypothalamus; this may be so because Fröhlich's syndrome, with its gross deposition of fat, is due mainly to hypothalamic disorder. At any rate, there are ample opportunities for both circulatory and metabolic disturbances.

Circulatory Disturbances.

Gigantism and acromegaly depend on anterior pituitary eosinophile excess. With the somatic overgrowth goes splanchnomegaly; the heart is enlarged, and there is hypertrophy of both arteries and veins. This was noted by Marie in his early descriptions. Acromegalics often suffer from vascular disturbances, including symptoms of Raynaud's disease, and they often die of heart failure with congestion. Giants are very powerful in their youth, but become very feeble as age advances; probably a similar enfeeblement occurs in the heart. One does not, however, commonly see acromegalics with hemiplegia, and such vascular accidents are not recorded in accounts of the disease.

Basophile tumours (Cushing's syndrome) also induce vascular changes: hypertension, arteriosclerosis, renal changes, plethora, acrocyanosis, ecchymoses and polycythæmia are all described and appear to be intensifications of the conditions found in acromegaly. The influence of the pituitary in essential hypertension is suggested thereby; possibly hypertension is induced by way of the adrenal.

The glandular activities of the anterior lobe of the pituitary have perhaps been best worked out in the sex glands. The basophile cells stimulate the ovary, and the ovary inhibits the pituitary. This influence of the ovary ceases at the menopause, and with its withdrawal there is nothing to check the stimulation of the suprarenal by the pituitary, hence the flushes common at that period.

Destructive lesions of the pituitary produce dwarfism in youth, wasting and low blood pressure in adults (pituitary cachexia or Simmonds's disease). There is some prospect of treating patients with such conditions by means of pituitary extracts.

Metabolic Disturbances.

I suggest that the general physician cannot at present distinguish between disturbance of carbohydrate metabolism induced by pituitary disease from that induced by pancreatic disease. I do not therefore raise the question of the influence of the pituitary in diabetes, nor, for the same reason, in Graves's disease.

What is clear to everyone, however, is the disturbance in fat metabolism which occurs in Fröhlich's syndrome, *dystrophia adiposogenitalis*. In New Zealand the first thing observed by the medical visitor is the prevalence of goitre, and the second the prevalence of obesity. Since the former is certainly endocrine and the latter may be, and the solidarity of the endocrine glands is now established, one wonders if they are associated.

Dystrophia adiposogenitalis is often transient.

I have notes of the case of a boy who began to be stout at the age of eleven years. At eighteen years he weighed about 87 kilograms (fourteen stone), had a boy's voice, immature external genitalia and no pubic hair. He had a very high sugar tolerance (the note regarding this is in the handwriting of Sir Stanton Hicks). At the age of twenty-one he had become sexually mature and weighed just on 69 kilograms (eleven stone). He is, however, mentally defective and has been in a mental hospital.

This condition is generally referred to disorder of the hypothalamus; but there appears to be a depression of pituitary function. The basal metabolic rate is generally −15% to −30% (Gardner Hill), whereas in acromegalics it is generally +20% to +40%. There is as a rule high sugar tolerance, though glycosuria is occasionally found, and one supposes that the carbohydrate is converted into fat. A low basal metabolic rate is not universal in obesity. Murray Lyon and the Edinburgh school record great variations both above and below normal in these cases. Cases of Fröhlich's syndrome are described in which treatment with anterior pituitary extracts has met with success.

If Fröhlich's syndrome is due to a pituitary defect, it is curious to find that Cushing's syndrome, due to pituitary basophile excess, while it has the characteristic high blood pressure and high basal metabolic rate, has at the same time the curious localized obesity of the trunk, though the limbs escape.

Acromegaly and Cushing's syndrome, being excess syndromes, cannot be treated with pituitary extracts.

Water metabolism appears to be controlled by the supraocular nuclei of the hypothalamus, acting through the posterior lobe of the pituitary. The action is probably on the kidney and permits the concentration of urine, perhaps by changing the permeability of cell membranes. When this function is disordered, *diabetes insipidus* ensues; this can be at least partly controlled by posterior pituitary extract.

As a broad generalization, anterior pituitary excess leads to overgrowth, hypertension, increase in the basal metabolic rate, with at present an imperfectly traced influence on the other endocrine glands. No medication is of any service in these. A defect of the anterior lobe of the pituitary leads sometimes to wasting, sometimes to obesity and a low basal metabolic rate. Patients with these conditions may be capable of treatment with anterior pituitary extracts. Water metabolism is controlled by the hypothalamus and posterior lobe of the pituitary, and persons suffering from excessive loss of water may be treated by posterior pituitary extract.

DISORDERS OF THE PITUITARY GLAND IN RELATION TO METABOLIC AND CIRCULATORY DISTURBANCE.[1]

By Sir C. Stanton Hicks,
Professor of Physiology and Pharmacology, University of Adelaide.

For some time past members of the staff of the Physiology Department of the University of Adelaide have been interested in pituitary function, both from the experimental and the clinical aspect. You are all aware that of all the varied functions of this central organ of internal secretion, perhaps the adenotropic action, by reason of its very wide effect, is the most striking. More important, however, is the interaction between the anterior part of the pituitary and the glands it influences. This is particularly well shown in the case of the gonads, which are brought into activity by the anterior lobe of the pituitary gland, and in turn, when such activity develops, they inhibit the functional activity of the specific stimulator cells of the pituitary. A less obvious interrelationship has been demonstrated to exist between the suprarenal cortex and the anterior lobe of the pituitary, and it is in connexion with this that I particularly wish to speak.

It was one of Dr. Frank Hone's cases which first drew our attention to some of the peculiar features of anterior pituitary cachexia. This case has already been reported at a meeting of the Royal Society of Medicine; but since then we have had the opportunity of studying three other cases.

Our knowledge of the cellular pathology of the conditions here discussed dates from the observation of Falta in 1913 of regression of sexual function and secondary sexual characteristics in cystic disease of the pituitary and atrophy of the suprarenal cortex. This was the first step in securing a firm basis for understanding the *insuffisance glandulaire* of the French clinicians. In 1914 Simmonds reported in *Verhandlungen der deutschen pathologischen Gesellschaft* the complete clinical picture of such cases. This consists of wasting and a prematurely senile appearance, with loss of hair, dryness of the skin and wrinkling of the face. Regression of sexual function and progressive decay of psychic activity terminate in coma and death. *Post mortem*, Simmonds found extensive atrophy of the internal organs and showed that the central feature of the pathological change in the pituitary was a destructive alteration of the cells of the anterior lobe, due to tumours, septic embolus, tuberculosis or syphilis *et cetera*. It is not my intention to go further into the clinical and physiological alterations to be found in this connexion, except to point out that in Dr. Frank Hone's case, already referred to, the curious associated vascular insufficiency reported by Schellong to the Wiesbaden Congress in 1930 was well established. This consists in a failure of the circulation (heart and vessels included) to adjust itself to changes in vascular loading consequent upon muscular effort. I wish also to draw attention to the beneficial effect of the oral administration of whole suprarenal gland upon both the vascular defect and the deranged sugar and fat metabolism. We demonstrated on this patient that at first prolan, the urinary gonadotropic hormone, and later preloban, the anterior pituitary preparation for oral administration, and whole freshly prepared suprarenal gland, all reduced the high glucose tolerance; but only the latter raised the respiratory quotient from 0·7 (or lower in the post-absorptive state) to 0·8.

The more one's attention is drawn to specific symptoms in anterior pituitary dystrophy, the more evident it becomes that this is much more common than the extreme form of Simmonds's cachexia would lead us to believe. Anterior pituitary disorder giving rise to wasting and altered psychic reaction is often classified as due to some endogenous metabolic disturbance, and the associated sexual dysfunction is accepted as an end result, not as an associated disturbance.

We have had during the past two years four patients with such conditions under examination, and they all happen to be females in their second decade. Compared with Simmonds's cachexia, in which wasting is extreme and in which the face also loses its subcutaneous fat, these patients all convey an impression of facial plumpness. The hair is plentiful and glossy—it is not so in Simmonds's disease—and its distribution down the cheek in front of the ears is typical. Next to the loss of weight, which can be quite rapid, disturbance of sexual function by cessation of the menses was the most important feature. Krause and Müller have this year reported histories of five young women, one woman aged forty-five years, and one man. In the man, loss of libido and impotence were associated with the loss of weight.

There is a marked psychic change. The subjects all become more readily irritated by circumstances to which previously they have been indifferent. They are easily fatigued, unable to concentrate attention for long, and are apparently erratic in their behaviour. One patient of ours, for example, will break off a set of tennis because she loses interest in it, and not, so she asserts, because she is tired, although fatigue undoubtedly plays a part. There are hypoglycæmia, low body temperature and low blood pressure. The pulse is extremely small, and the diastolic pressure is almost impossible to measure. There is acrocyanosis. All these are signs of suprarenal involvement. The associated thyreoid defect is seen in the characteristically lowered rate of metabolism. In all these features I find that Krause and Müller's findings corroborate our own; but these workers do not report any investigation of the gaseous metabolism such as has been conducted by us. The respiratory quotient in all the Adelaide patients ranged from 0·65 to 0·76 in the resting state. After a meal or exercise it rises to 0·75 or 0·8. In

[1] Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

this it behaves just as in the severer form described by Simmonds. Associated with this profound disturbance in the utilization of carbohydrate and fat there is also a distaste for starchy foods and for fat, that is, butter, cream and animal fat. The distaste for potato is quite a striking manifestation, and three patients declared that they suffered from indigestion after eating this food. The appetite, then, is poor and disordered, and at the same time there is an objective finding of a low respiratory quotient. The failure of appetite is strikingly similar to that seen in Addison's disease, and now that we know the functional connexion between the anterior part of the pituitary and the suprarenal cortex the pathological findings in Simmonds's disease and in Addison's disease are not surprising. The original observation of Kraus has recently been confirmed and extended by Dorothy Russell and A. C. Crooke, who showed that in Addison's disease the number of basophile cells of the anterior lobe of the pituitary is reduced to one-fiftieth or even one five-hundredth of the normal.

We have found in our studies of Addison's disease that, provided a potent cortical extract was available to combat the "crises" of that condition, the energy, vascular efficiency and metabolism could be largely restored by administration of whole suprarenal gland. This restoration was associated with a sudden increase in demand for carbohydrate; in one instance the patient persuaded a friend to bring sweets to her in the ward, whilst prior to the administration of suprarenal gland she avoided sugar and ate as little starchy food as possible.

Clearly there is a close relationship between these two types of disease: that of suprarenal and that of pituitary origin. It is suggested by Krause and Müller that the plump features are a manifestation of hunger œdema. I am not in a position to affirm or deny this; but the appearance is certainly strikingly similar in all cases, except in Simmonds's cachexia. Here, where emaciation is extreme, it is absent, a fact which causes me to hesitate in accepting the explanation given by the authors.

Krause and Müller discuss whether the lack of appetite is a primary cause of the loss of weight or a secondary result of the pituitary dystrophy. Our own experimental work on subjects of Addison's disease and on adrenalectomized animals indicates that it is a result of the loss of adrenal cortical activity, and the effect of the administration of whole fresh adrenal gland in both Addison's disease and pituitary cachexia is not only to increase appetite, but to increase the intake of fat and carbohydrate. Evans and his colleagues also consider that the loss of appetite in hypophysectomized animals is due to the resulting atrophy of adrenal cortex, which does not occur if anterior pituitary extract is administered. Anselmino, Hoffman and Herold have repeated this, using the pure corticotropic hormone from the anterior lobe of the pituitary.

Atwell was unable to prevent the atrophy of the adrenal cortex in a hypophysectomized animal by the use of cortin, and our experience with cortin in Addison's disease, compared with the effect of oral administration of whole freshly prepared suprarenal gland, supports his findings regarding the altered metabolism and appetite as clinical indices of cortical atrophy. In our experience, although cortin has a striking effect on the Addison's "crisis", it fails to restore either the appetite or the carbohydrate metabolism or the vascular efficiency.

In 1934 Abel and Kissel in France, and Aitken and Russell in England used cortical extract, and independently Hicks and Hone were led to the use of adrenal whole gland in the treatment of hypophyseal cachexia, after Hicks and Mitchell had found it efficacious in restoring appetite and physical capacity in Addison's disease.

Kalk and Krause and Müller agree in suggesting the use of cortical extract in dysfunction of the anterior lobe of the pituitary when the pituitary extracts alone fail to bring about improvement.

In conclusion, one may say that there is accumulating evidence for the existence of more hypophyseal cachexia than the rarer and severe cases of Simmonds's cachexia would indicate. There is clear objective evidence in our own series, some of which is given in the clinical summary, that the altered appetite and food selection are based upon a dysfunction of the anterior lobe of the pituitary and of the adrenal cortex, which causes altered carbohydrate and fat metabolism. Then there is the therapeutic indication of the original pathological findings by Kraus, by the favourable effect of whole ox adrenal gland prepared so as to avoid or minimize biochemical alteration after removal. Finally there is evidence put forward by both Krause and Müller, and supported by our own experience, that treatment may be followed by an extensive clinical improvement, which remains after the cessation of therapeutic measures. This suggests that there is a stage of functional disorder which precedes the organic change and which, if combated, reverses a vicious cycle doubtless in the hormonal interrelation between adrenal and hypophysis.

Acknowledgement.

I wish to thank two of my students, Miss O'Loughlin and Miss Fox, for their assistance in making many of the tedious metabolic measurements in the course of this clinical study.

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TABLE I.

Results of Investigations Carried out in Case I.

Date.	Weight in Kilograms.	Time.	Pulse Rate.	Respiration Rate.	Respiratory Quotient.	Basal Metabolic Rate in Calories per Square Metre of Body Surface.	Medication.
September 6, 1934 ..	35·6	9 a.m. 11 a.m. (After breakfast) 2.30 p.m. (one hour after lunch)	54	20	0·58 0·68 0·94	—	Prolan after breakfast.
September 14, 1935[1] ..			50	20	0·53		
November 12, 1935 ..	31·4	9.30 a.m. 12 noon 2.30 p.m. 5.30 p.m. 8 p.m.	42 44 55 60 50	20 24 25 25 24	0·99 1·0 0·88 — 0·77	44·0 25·56 27·0 20·87 — 12·25	"Cortin" morning and evening for previous two weeks.
November 30, 1935 ..	31·4	9.30 a.m. 1 p.m. 5 p.m.	70 75 74	28 28 30	1·1 1·1 1·19	30·5 34·77 34·66	Suprarenal tablets.
December 17, 1935 ..	32·6	9.15 a.m. 1.45 p.m. 5 p.m.	58 58 56	28 32 36	1·2 1·36 1·16	33·38 37·79 43·45	Suprarenal tablets.

[1] At rest in bed in hospital, without food since 8 a.m. on the previous day.

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C. Stanton Hicks and M. L. Mitchell: "The Treatment of Addison's Disease by Whole Adrenal Gland", *Proceedings of the Royal Society of Medicine*, Volume XXVIII, 1935, page 63.

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Appendix.

CASE I.—Miss J., aged twenty-four years, suffering from Simmonds's cachexia, was seen on September 6, 1934. Her height was 162·5 centimetres (five feet four inches) and her weight 35·6 kilograms (five stone nine pounds). The results of investigations are shown in Table I.

CASE II.—Miss O., suffering from dysfunction of the anterior lobe of the pituitary, was seen first in 1934, when her height was 158 centimetres and her weight 37·0 kilograms. The results of investigations made at that time are shown in Table II.

Further investigations were made in 1935 (see Table III).

TABLE II.

Results of Investigations made in Case II in 1934.

Condition.	Respiratory Quotient	Basal Metabolic Rate in Calories per Square Metre per Hour.[1]
Resting for two hours (post-absorptive)	0·64	31·2
After protein meal (20·0 grammes)	0·64	40·88
After carbohydrate	0·82	30·0
Resting (not post-absorptive) ..	0·71	
During exercise	1·1	
Immediately after exercise ..	0·9	
Ten minutes after exercise ..	0·57	

[1] Approximate only, a respiratory quotient of 0·7 being used.

TABLE III.

Results of Investigations in Case III in December, 1935.

Date.	Weight in Kilograms.	Time.	Pulse Rate.	Respiration Rate.	Respiratory Quotient.	Basal Metabolic Rate in Calories per Square Metre per Hour.
December 17, 1935	37·1	10 a.m. 1.30 p.m. 5 p.m.	56 56 58	14 14 16	0·7 0·7 0·66	16·97 32·04 36·7
December 20, 1935[1]	36·0	10 a.m.	60	14	0·75	30·1

NOTE.—At 6 p.m. on December 16 she suddenly felt weak and dizzy and suffered from headache; at 6.30 p.m. she complained of colicky pains and vomiting; she felt tired on the following day.

[1] Taking 0·3 gramme of suprarenal gland in tablet form after each meal.

She continued to take 0·3 gramme of suprarenal gland each day from December 18, 1935, to February 26, 1936. One week after discontinuance of the suprarenal administration her pulse rate was 50 and her respiration rate 14 per minute. The respiratory quotient had fallen to 0·63. Since then her weight has varied from 40·0 to 43·0 kilograms. Her systolic blood pressure is 115 and diastolic 80 millimetres of mercury (originally the diastolic pressure was unreadable). She craved for sugar during treatment, especially at 4 p.m. and 8 p.m., and she often had an "over-stimulated feeling". The appetite improved and the sugar tolerance improved, although no treatment has been given since February, 1936. The respiratory quotient is now 0·76 to 0·79 and the basal metabolic rate 42 calories per square metre of body surface.

HOW CIVILIZATION MANUFACTURES NEUROSES: A SURVEY OF 200 CONSECUTIVE CASES.

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In 1934 Dr. Frankwood Williams published a very provocative book entitled "Soviet Russia Fights Neurosis". The work has not received the consideration which it merits, largely no doubt from a very natural conservatism. We do not wish to belaud communism, a form of social control in so many ways inferior to our own. The merit of the book lies not so much in its description of mental hygiene in Russia, but in its viewpoint that democracy as we know it is facing ever-increasing crops of neurosis for which we are half-heartedly attacking the branches instead of dealing with the roots.

Shall we look to the psychiatrists? It has been our method. Were there a thousand able psychiatrists for everyone that now exists we should not touch the situation. With spiritually crippled individuals being turned out by the basketful, what opportunity, on a scale to be socially significant, has an individual, clinical method even under the best of circumstances, and when that work must be done in the atmosphere of the factory that created the condition—what can be said?

Such a challenge is worthy of attention. It has stimulated the following survey of 200 consecutive case records met with in private psychiatric practice. The object has been to evaluate the extent to which environmental factors are responsible for mental ill-health. It will be conceded that no research of this limited nature will be sufficient to form logical proof that our present system requires drastic overhaul on communistic or totalitarian lines, but it may at least give food for thought as to whether there is need for a recasting of at least some of our cherished ideals on individualistic democracy. The view that our profession does not concern itself with a sufficiently wide range interest in sociological problems is unassailable. It is a regrettable fact that our medical associations give no official backing so as to ensure that their members are directly represented in parliament. In view of the key position which our profession holds, the apathy is inexcusable.

[1] Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

No method of sociological research is susceptible of mathematical accuracy, but must be influenced by the personal bias of the observer. Nevertheless an attempt has been made to be impartial. After the patient were seen, they were assessed in terms of the principal ætiological factor.

The totals suggest that environment plays a large part in the genesis of morbid mental states.

The number of cases considered to be physical or mental states in which environment played a minor rôle amounted to 105. This list includes those whose disability did not amount to a neurosis, those whose period of observation was not sufficient to warrant a diagnosis, and those suffering from insomnia, drug addiction, manic depressive psychosis and other psychoses.

There remains a total of ninety-five patients suffering from neuroses and psycho-neuroses. Instead of being classed under the labels of end results, these will be arbitrarily pigeon-holed in terms of what appeared to be the chief ætiological factor. It will be argued that underlying the individualism is a type of inborn mental weakness, a psychopathic personality which predisposes to invalidism. This is a legitimate contention; it is, however, contended that large numbers of people possess this defect, but remain stable because the environment is harmonious. Had circumstances been different the majority of these unfortunate people would have remained healthy. We are restating the age-old controversy of heredity *versus* environment. If the existence of an odd neuropathic ancestor is to be considered indicative of the cause of mental disorder, then civilization is surely doomed, because almost every man who searches his family archives will find examples of a morbid psychological diathesis.

The criticism will be doubtless made that the ætiological factors assigned as prime causes are far too superficial and a more thorough search would have revealed sexual and other psychic traumata of infancy and childhood. Here again it may be argued that such incidents may be found in those who do not suffer from nervous illness. Moreover, there is a therapeutic test in that so often a mere change of environment, a superficial readjustment, is sufficient to restore the invalid to health.

Sex.[1]

Nine persons fall into a category which denotes that sexual problems were of outstanding importance. Of these, eight were unmarried and repression would appear to be the predominant factor. Had civilization evolved a code whereby at adulthood the mating of the sexes could have been made easy, the problem would not have arisen. The economics of marriage which debar many on account of finance, and faulty sexual education on the part of parents are both responsible for many neuroses. In addition, the stream of sex literature is creating an appreciable

[1] Some of the histories quoted by Dr. Bostock have been omitted owing to lack of space.—Editor.

number of sex cranks who pry too deeply into a natural function. Whilst a free Press is admirable in many ways, medical pornography free to the public must be condemned on every count.

Case I.—An intelligent girl suffered from a severe gastric neurosis with profound air swallowing and inanition. Investigation revealed parental repression and an unhappy love affair of which the parent was entirely ignorant. Psychological discussion produced an environmental alteration and a rapid cure.

Case IV.—A bachelor on the eve of marriage was confronted with mental disorder in a *fiancée*. Eugenically minded, he strove against parental advice to continue the engagement. Medical assistance in his praiseworthy point of view enabled him to tide over the emotional crisis, to free himself from his legal obligations and encompass a complete recovery.

Case II.—An intellectual woman, aged thirty years, possesses such powerful sexual urges as to produce insomnia and an anxiety state. A religious upbringing debars promiscuity as a relief. Although she is slowly learning to sublimate her *libido*, it is deplorable that convention and circumstances will not permit the logical solution of one whom Nature intended to be the mother of worth-while children.

Case LV.—A married woman in this instance is an example of faulty education. Neither partner at marriage knew the rudiments of sex technique. Intercourse was never properly consummated and a sense of frustration led eventually to a melancholic episode. Explanation of first principles to both man and wife has led to pregnancy and a mental recovery.

Case CXXXII.—A highly intelligent woman brought up in an atmosphere of repression and complete sex ignorance, had a slight love affair years ago. Unable to discuss it, she unsuccessfully tried to repress the incident and slowly developed an obsessional neurosis. Inability to change the environmental conditions has resulted in chronicity, little relieved by psychotherapy. Her visit to a psychiatrist should have been years earlier.

Loneliness.

Under the heading of loneliness are seven persons, or 3·5%. The happiest people undoubtedly lived in the old-time patriarchal communities. The unit was a large family, a clan in which the rich and poor were integral units of the same kin. The problem of loneliness did not occur. Today large cities may be the loneliest places in the world for many. Moreover, city life is producing a type of mind which is unhappy away from its confines. To quote Spengler:

> Homesickness for the great city is keener than any other nostalgia. Home is for him any one of these great cities, but even the nearest village is alien territory. He would sooner die upon the pavement than go "back" to the land. Even disgust at this pretentiousness, weariness of the thousand hued glitter, the *tædium vitæ* that in the end overcomes many, does not set them free. They take the city with them to the mountains or the sea. They have lost the country within themselves and will never regain it outside.

In the city itself the family disintegrates. Children go to distant suburbs; others depart to distant cities. The survivors may be left friendless. It is not surprising, therefore, that loneliness plays a major rôle in many nervous states.

Case XXXVIII.—An intelligent professional woman lives alone in her house. Her work is exacting during the day. At night she returns to cook, clean and do household chores. Social intercourse is difficult and finally, becoming a nuisance, she develops into a hermit, with delusions of persecution at the hands of her neighbour. The latter symptoms finally bring her for advice. Renting of her house, life in a boarding establishment, more companionship and a frank psychological discussion have made a great change in her outlook.

Cases XCI and CIII.—Two intelligent city women have gravitated to a life in the bush. Their hysterical symptoms tend to disappear when they return citywards. Although greatly benefited by a psychological discussion and an appeal for them to make more use of the social amenities of the country, it is doubtful whether the lure of the city will not yet prove too strong.

Unfitness for Domesticity.

Under the heading of unfitness for domesticity are four persons, or 2%. That a woman's place is in the home is a truism. This, however, does not apply to all women. The four cases which fall into this category are instructive in that the patients are intelligent individuals who served a long probationship in another avocation and developed the fixed habit of outside work. The old occupational persona could not be fitted to the marriage persona. Boredom resulted.

Case III.—A middle-aged woman was a milkmaid in the Old Country. Later she married a dairyman in Australia. He consistently refused to allow her into the cow bails and eventually she developed a manic reaction. Upon advice, help was obtained in the house, and she was permitted to follow her desires. The result has apparently been satisfactory.

Case CI.—A professional man's wife early displayed much interest in his work. A later affluence made this unnecessary, and the care of the children was insufficient to prevent the onset of a mild neurosis, of which restlessness was the main feature. Psychotherapeutic conversations have given her more insight and a greater stability.

Occupational Misfits.

Under the heading of occupational misfits are 36 persons, or 18%. Modern civilized conditions tend to an increasing specialization. A boy enters an occupation, and unless he is very fortunate must continue in the same line of work, even though he realizes that he is a misfit. There is much to be said for teaching every boy at least the rudiments of two or more trades. This has several advantages. The outlook is broadened, self-reliance is increased, and more choice is permitted in the search for congenial work. No less than 36 fall into the category of occupational misfits. The list is far too long for individual mention. The cases fall into the following categories. Those in which (*a*) the type of work is unsuited to the type of mind, (*b*) environmental difficulties have occurred in the work, (*c*) the work is too exacting.

In the first category the most frequent error is giving purely routine work to an individual whose mentality is suited to administrative duties. He has the capacity to plan, to think clearly, to have vision of wholes instead of mere parts, yet he is compelled to do routine jobs which call for neither planning nor vision. Usually of the introvert type which requires encouragement in the early stages, he has

not the self-confidence to brave the dangers of the unknown, so carries on until neurosis befalls. Outstanding examples of the use of occupational therapy are found in this category. The progress is truly spectacular provided that the job can be changed.

Case V.—A youth was employed at routine clerical work and developed a habit of day-dreaming which finally resulted in hysterical episodes. Both disappeared when he found an interesting billet which required physical work.

The second category contains a wide variety of occurrences, temporary or permanent, which make work abhorrent. Usually they occur in the sensitive but efficient introvert types who take work too seriously. The modern tendency of modern business to aim at 100% efficiency is a menace to many. In any case they would work well. The extra spurring of these slaves by the lash of commerce breaks their spirit. A new type of work slave is with us, though slavery is officially abolished in civilized countries.

Some of the cases will be briefly summarized. The advancement of very capable women clerks is stopped because men must have senior positions. A hard working executive has to work in dingy surroundings with an impossible boss. A keen nurse found herself in a hopeless environment of inefficiency which promised considerable scandal. A brilliant public servant was in a position which made the ingestion of alcohol almost obligatory. A first-class business man had to work under the control of an obtuse choleric father *et cetera*.

In the third category the burden of taxation, the keenness of competition and the general high cost of living are constant spurs to more and more work. Whilst the happy-go-lucky type of individual will thrive in any environment, the more valuable, thrifty, efficient type is apt to be penalized by our modern conditions. For the latter, the so-called freedom of our democratic age is an illusion rather than a reality.

Our list includes an hotel-keeper, a barber, a music teacher, and two grocers who worked from early morning to late at night, a successful broker overwhelmed by his clients, a cane-cutter who sought to maintain his place as a champion, and a farmer who fought a losing fight against bad seasons and poor markets. There were also several officers of a religious domination whose conception of duty does not allow place for relaxation.

Financial Loss.

Under the heading of financial loss come five persons, or 2·5%. It is perhaps strange that the financial depression produced so few neuroses. Money is not so important as we had imagined. The experience of the Great War showed conclusively that shelter, food and clothing were the great, if not the only, props to euphoria. The socialists might employ this finding to the furtherance of their tenets.

Our cases include a middle-aged man and an elderly woman, both struggling with the impossible task of paying off a heavy mortgage. An old man had lost £3,000 in a bad deal. A middle-aged man had failed on account of fruit fly and drought. A woman in the sixties found herself almost penniless after the death of her husband. It will be noted that all have passed the Rubicon. With the advancing years the patient is aware that the chance of repairing financial losses is negligible.

Compensation.

Under the heading of compensation are three cases. No review of sociological conditions would be complete without a reference to the problem of the compensation neurosis. The psychological evils which follow the light-hearted donation of pensions and compensation are so serious that the medical profession should state their opinions more freely. Not merely does the public conception of an overflowing pension cup tend to mass pauperization; it penalizes the thrifty and its produces a large amount of actual invalidism. The remedy is difficult and vested interest is strong; but the question must be seriously to the fore in the not distant future. Is it too much to hope that we, as citizens, should gather information from the medical angle and attempt through political influence to make parliaments view it in a proper perspective.

The three persons in the series were frankly hysterical. All had received a full pension, and one was concerned that it should be blessed with the seal of permanency.

Home Environment.

Under the heading of home environment are 25 cases. As domestic life takes such an overwhelming place in the character formation of children, its importance is obvious. On the last analysis it is the most prolific contributing factor in the causation of the neuroses. Probably many of the previously discussed ætiological influences would have had no deleterious effects if the family environment had been different. The home environmental factors fall into four main categories: (i) upbringing, (ii) the over-possessive family, (iii) discord in the family, (iv) the influence of the in-laws and step-parents.

The group possesses peculiar difficulties to the psychiatrist, since family readjustment is extremely difficult. Removal of the patient to another environment or hospitalization are alternatives, but eventually there must be a return to the home. The remedy must be sociological—more education of parents or the compulsory sending of all children to boarding schools. At the present time even the extension of the school age seems a radical step, but the stage is being set for far more drastic changes. Home life is losing its sanctity. The flat dweller has no accommodation for children. Fast motor cars make unsafe those old-time playing fields—the highways and by-ways. It is highly questionable whether the present system of education can survive, especially as there is a consensus of opinion that it has become far too theoretical. Practical civics, housekeeping and the trades must be substituted in part for the academic study. As the children will have to do the housework as a training, the cost of state boarding establishments

will not be comparable to that of private institutions. At the present time the children already have both food and teachers.

Boarding school life often lessens the results of an over-possessive family and discord in the home. The in-law problem will, of course, still remain.

Let me present some examples.

Upbringing.

Case XXXI.—A girl of seventeen years has schizophrenic trends with bizarre delusions. The mother is inefficient and incompetent. Her elder brothers are working. The home life is very depressing. The girl was sent to a cheerful aunt, with whom she has remained for a year. Although she is still reclusive, there has been a tremendous improvement.

The Over-Possessive Family.

Case XLII.—The patient is a woman of thirty years. A family of five children remain at home. None of them have married. The members of the family live for themselves, and the patient when first seen had become so reclusive and negativistic as to be considered a sufferer from *dementia præcox*. She was advised to go out every day and to have more social intercourse. Fortunately, the family was intelligent enough to see the point of view and cooperated. There has been considerable improvement.

Discordance in the Home.

Case LII.—A woman, aged forty-three years, of the clinging type, had an impossibly erratic and improvident type of husband. The advent of children made matters worse, so that she finally became an hysteric. Admission to hospital, with subsequent removal of the children to a home, and life in a boarding house have entirely altered her outlook.

The In-Laws and Step-Parents.

It is surprising that only three cases fall into the category of "in-laws and step-parents".

Case XXXVII.—A married woman, aged thirty-two years, has had an undoubted physical basis for many symptoms, for example, cholecystitis, tonsillitis, hay fever *et cetera*, but there is a superadded functional element attributable to her need for sympathy. The only sister, who is in part the breadwinner, has not merely a distinct fixation for her, but lives in the same household. Whilst the condition has improved by attention to the physical background, the perforced continuance of the environmental factors has retarded any satisfactory psychotherapeutic results.

Educational Misfits.

Under the heading of educational misfits are six persons (3%). One of the most disheartening features in psychiatry is the tendency to postpone consultation until the disease has been completely established. The public is so poorly educated that only a fear of insanity will make the patients seek advice. Far more children should be treated on psychological lines. There is a distinct need for further propaganda by our profession. Mental hygiene should be encouraged in the Press, on the radio *et cetera*, not as at present by lay psychologists, but by accredited members of our own profession. The danger of advertising should be met by communications not from anonymous but accredited doctors. Undoubtedly the number of cases in our series is not a true indication of the importance of the education problem.

Our cases fall into three categories: (i) difficult children, (ii) intelligent children misapplied, (iii) faulty environment.

Difficult Children.

Case CXVII.—An adopted son, aged ten years, was brought on account of restlessness and inattention. The boy, although intelligent, was scatter-brained and could not be persuaded to concentrate on his lessons. Examination revealed a low hæmoglobin (60%). This secondary anæmia was relieved by the administration of iron. Lessons were given at home, but no great improvement was shown until the child was boarded out and went to school.

Intelligent Children Misapplied.

A number fall into the division "intelligent children misapplied" in the following manner. Characteristically the child is above the average in his class, progresses well up to a point, and then begins to retrogress. The child becomes dull, loses grip of his lessons and takes a lower place in his class. Interrogation usually reveals that day-dreaming and phantasy thought have taken the place of directed thinking. The nervous energy is scattered and as a result all the intellectual pathways suffer. The remedy lies in taking the child away from school and sending him to manual work, carpentry, wood-carving, gardening *et cetera*, for two or three months; books are taboo. The results are very encouraging. The power of concentration returns. Day-dreams with a hammer in one's hand are almost impossible.

Case CXVIII.—A boy, aged twelve years, suffered from inattention and lack of grip. Two months at the polytechnic and a month of farm work produced a complete loss of symptoms.

Case XXVIII.—A boy, aged sixteen years, suffered from writer's cramp. He had been encouraged to take higher examinations and had worked until late at night, eschewing sport and companionship. The use of a thick pen, the practice of writing on the pot-hook plan and a recasting of his curriculum proved a satisfactory remedy.

Faulty Environment.

Case LXXII.—A girl, aged fourteen years, had fits of emotional depression and found her work very difficult. The underlying basis was obvious. The father and mother were separated, and the child attempted the impossible task of reconciliation. Thanks to the girl's being intelligent, it was possible to posit the problem on lines which reduced the worry. She returned to her work under far happier auspices.

Summary.

Whilst it is admitted that a series of 200 cases is insufficient to give an accurate cross-section of the incidence of nervous disorders and their ætiological factors, there exists an adequate basis for certain conclusions. Psychiatric investigations must be made on broad sociological lines. The effects of environment are outstanding, and should lead to an earnest questioning as to the stability of our social order. Although patriotism leads us to belaud our own Anglo-Saxon type of democracy as the Ultima Thule of social organism, it should not blind us to the fact that civilization today stands at the crossroads. Never in the history of the world have there been such gigantic experiments in sociology. Russia has adopted communism, whilst Germany

and Italy are perfecting a totalitarian state. We ourselves are wedded to a system which glorifies individualistic enterprise. The end is not yet, but it is certain that the fittest will survive. That there are defects in our system is obvious, and even a cursory view of this series of cases must point the moral. Can we patch up our individualistic system so as to obviate the defects or must we have the revolutionary adoption of an entirely new system? Can we educate our population to a point at which they can adapt themselves to difficult environments, or must we so change the environment that reform becomes automatic? A happy individualistic state of large dimensions and great complexity can exist only in an educated and enlightened populace. Are we achieving this desideratum or are we merely allowing matters to slide with the faith that somehow or another we will muddle through? Our own profession has very definite duties in this regard. Possessing trained minds and seeing at first hand the end results of our social order, we should be in the forefront of reform movements. The day for a parochial outlook has passed. We ought to be prepared to do battle in the larger arena of national service.

This study of the ætiological causes of nervous disorders indicates several lines of reform. The problems of compensation and insurance, the over-glorification of the city, over-taxation, vocational guidance, the ideal type of education, the one-child family, late marriages, celibacy, depopulation, woman's usurpation of man's occupation, the evils of financial insecurity, and the weakening of home and moral ties—all are echoed in our survey. It must never be forgotten that the basis of all prosperity rests on the moral fabric of its citizens, and not, as so many assume, on its prosperity in materials.

Can we in fact regard these problems with equanimity or ought we as a profession to take a firmer stand in discovering that happy medium which will maintain the maximum happiness for the greatest number? Ought we not to do more research into the ætiological factors of disease, in order to be able to point an unerring finger at those basic environmental factors which produce nervous and physical disharmony?

Reports of Cases.

OTOGENOUS MENINGITIS WITH RECOVERY.

By T. BOYD LAW, M.B., Ch.M., F.R.A.C.S.,
Lismore, New South Wales.

THE treatment in the following case of meningitis was inspired by clinical records published in recent medical literature, notably a series of nine cases with seven recoveries written up by James Adam and Edward Connal, of Glasgow, in *The Journal of Laryngology and Otology*, Volume LII, February, 1937, page 87.

Mrs. D., aged fifty-four years, was admitted to Lismore Base Hospital on July 24, 1937, with a history of discharge from the right ear of four weeks' duration. There had been "shooting pains through the head" on the right side for a few days prior to her admission to hospital. There were signs of mastoid involvement and mastoidectomy was performed; a fair amount of bone destruction was present, but the sinus plate and sinus were healthy and the *tegmen antri* appeared to be intact. The wound was drained in the usual way with folded rubber glove. On July 25 the patient was comfortable; the temperature was 37·8° C. (100° F.) and the pulse rate was 84. That night she complained of severe headache, and on July 26 she showed manifest signs of meningitis; severe headache, pain in the back of the neck, head retraction and Kernig's sign were all present. The temperature was subnormal all day and the pulse rate was always over 120.

Lumbar puncture was performed that day by Dr. Rawle, and examination of the cerebro-spinal fluid by Dr. Pearce at the Government Laboratory revealed 380 cells per cubic millimetre, mostly polymorphonuclear cells, and an increase in globulin. Pus cells and streptococci were seen on a direct smear. A culture was made, resulting the next day in a heavy growth of hæmolytic streptococci. An injection of ten cubic centimetres of "Prontosil" was given intramuscularly on the evening of July 26. That night the patient was quite irrational. On July 27 the temperature rose to 39·45° C. (103° F.) and the pulse was less rapid (about 90 to 96) and of better volume. Slight facial palsy was present on the left side (the opposite side to the mastoid). I decided on that day to open the dura. The *tegmen antri* was widely removed and an incision was made in the dura. The brain pushed down into the wound, but the cerebro-spinal fluid drained away freely. Exploration of the brain revealed no abscess. During the night the cerebro-spinal fluid soaked the dressings several times. The foot of the bed was raised to assist the drainage. The rubber glove drain was changed once daily.

On July 28 the patient's general condition was decidedly improved; the temperature was 38·9° C. (102° F.) and the pulse rate was 104. Ten cubic centimetres of "Prontosil" were now given intramuscularly twice daily, and sixty cubic centimetres of antistreptococcal serum were given once daily. During the next few days there was a steady improvement, and on July 31 the temperature was 36·7° C. (98° F.) and the pulse rate was 88. The headache was gone; the patient was quite rational and feeling well. All injections were stopped after August 2, 1937, and recovery and convalescence were uneventful. The facial paresis disappeared about six days after its appearance. The patient was discharged from hospital on September 5, 1937.

When she was last seen, on September 17, 1937, the hearing test gave the following results. The right ear heard the whispered voice at three feet. The right labyrinth gave a negative response to Bárány's caloric test.

ANOMALOUS SEROLOGICAL FINDINGS IN A CASE OF DEMENTIA PARALYTICA.

By P. GUY REYNOLDS,
Melbourne.

THE following case appears to be worthy of record, as it presents the extremely unusual combination of a frank and unequivocal clinico-pathological picture of *dementia paralytica* with no response to the Wassermann test in either the blood or the cerebro-spinal fluid. The rarity of such a finding may be judged from the fact that Plaut,[1] in a series of 1,420 paralytics, found only six unquestionably genuine cases in which the blood gave no reaction to the Wassermann test, while in another series of 1,050 cases he found only 36 in which the cerebro-spinal fluid failed to react to the Wassermann test.

M.J.E., a pale, ill-nourished man, aged forty-five years, was admitted to the Mont Park Mental Hospital on January 14, 1937. The Wassermann reaction of his blood was reported to have been positive seven years prior to his admission. On examination he presented a typical picture of advanced organic dementia. He was markedly dull, disorientated in all spheres, childish in manner, and suggestible. His memory for recent events was grossly defective. He was unable to repeat five digits correctly. His speech was slurred. The right pupil was slightly larger than the left; the reaction to light was sluggish. Examination of the *fundus oculi* revealed no abnormality. Tremor of the tongue and lips was present. All the deep reflexes were hyperactive and there was extreme spasticity of both the upper and lower limbs. The superficial abdominal reflexes were present; the plantar reflexes were strongly extensor. In view of these findings a diagnosis of *dementia paralytica* was made, and the patient was inoculated with ten cubic centimetres of malarial blood in anticipation of the serological examination which was performed four days after his admission to hospital. Neither the blood nor the cerebro-spinal fluid reacted to the Wassermann or the Vernes test. The total protein of the cerebro-spinal fluid was found to be 0·077%; the test for globulin gave a positive result, and there were seven cells per cubic millimetre. These findings were confirmed by a further examination ten days later. Paretic curves, 5554211000 and 543221100 respectively, were obtained with the Lange test by two independent observers.

On account of the presence of severe anæmia the course of malaria was prematurely terminated. In spite of intensive treatment the patient's condition became progressively worse until his death on February 25, 1937. Autopsy, performed by Dr. C. Farran-Ridge, revealed the macroscopic and histopathological changes characteristic of *dementia paralytica*.

Reference.

(1) E. Kraepelin: *"Klinische Psychiatrie"*, 1927, pages 972 and 980.

Reviews.

PROGRESS IN ENTOMOLOGY.

ANYONE writing in the "Recent Advances" series must keep his book up to date if the title is to have any meaning at all. It is therefore not surprising that Dr. Imms has brought out a second edition of his "Recent Advances in Entomology",[1] the first edition of which was published in 1930.

Dr. Imms in no way attempts to embrace the whole field of research in entomology, but only "certain aspects of the subject along which recent advances have been fertile in facts and ideas". He writes for the student and the teacher, collecting together those facts generally omitted from text-books and which have not formed whole subjects of books themselves.

The excellent outline drawings, which clearly illustrate the text, add greatly to its value for the student, for the teacher and for those embarking on the field of research in any one of these subjects. Of the ninety-four illustrations in this edition, twenty-seven are new and eighteen of the original illustrations are now omitted. Sixty-five appear in the first half, that is, in those chapters concerning structure, as opposed to the later chapters on ecology, parasitism and biological control.

The student will also welcome the extensive bibliographies at the end of each section. These are comprehensive, and the literature ranges over a wide period, though the majority are of comparatively recent years, for many departments of entomology are almost a new science. There is also at the back of the book not only a general index, but also a very detailed index of authors, indicating the vast amount of research done by the author in compiling this work. After a detailed discussion each section ends with a complete summary of the results and conclusions drawn.

The substance of the book may be divided into two parts, the first dealing with morphology and general detailed systematic research, and the second taking the wider aspect of entomology, embracing ecology, parasitism and biological control.

In this edition, under the heading morphology, the part dealing with the segmentation of the head is, in view of the recent work done in insect embryology, completely revised. It is now generally accepted that the head is made up of six embryonic segments fused. Until recently little was known about the genitalia. Even now there are large gaps in our knowledge of these structures, but recent work along the lines of taxonomy has done much to bring to light the details and homologies of these structures, particularly those of the male. Homologies of the metameric appendages have also been further revised, and the recently discovered presence of hormones is discussed in reference to metamorphosis. The chapter dealing with palæontology has been completely revised in view of the rapid development of this branch of the science, mainly the result of work done by the late Dr. F. J. Tillyard, of Canberra, F. M. Carpenter, of Harvard, and A. B. Martznov, whose work lies among the fossil beds of north Russia.

In the two chapters on "sense organs" revision has been made in the section dealing with response to visual stimuli, and the new subject of stimulatory organs has been introduced. Dr. Imms points out that it is being realized more and more how important it is for the practical entomologist to study insect behaviour as well as life histories if his methods of control are to be successful.

The final chapters on biological control have been entirely rewritten, for this branch of the science is being studied and practised in every country of the world today, and the results and findings in one country are all-important to those facing similar problems and often identical pests in another. An account is given of the spectacular success Australia has had in the biological control of prickly pear.

[1] "Recent Advances in Entomology", by A. D. Imms, M.A., D.Sc., F.R.S.; Second Edition; 1937. London: J. and A. Churchill Limited. Large crown 8vo, pp. 441, with illustrations. Price: 16s. net.

HEART FAILURE.

THE name "Heart Failure" on a book suggests a very comprehensive treatment of one of the most important subjects in the realm of medicine, and readers of A. M. Fishberg's book[1] will find that the author has pursued the same detailed plan as in his well-known "Hypertension and Nephritis". Its chief feature is a complete presentation of the relevant information on the physiological, pathological and clinical aspects of the subject, and its keynote is the study of the perverted physiological process at the bedside. Fishberg contends, and rightly, that a knowledge of first principles is the only sound foundation for the logical application of clinical methods, and he therefore devotes considerable space to the theoretical considerations underlying the maintenance of the circulation and the manner in which it may be disturbed. He is careful, however, to keep the clinical bearing of heart disease in the forefront of his discussion, and constantly makes reference to case histories, personal experiences and those other practical applications which help to perform that difficult feat of welding the union of science with the art of treatment. It must freely be admitted that a busy doctor cannot expect to flip over the pages of his book in order to find in one place simply and dogmatically expressed just why his patient has, say, pulmonary œdema and how he is to try to relieve it. It is not a brief handbook on the diagnosis, prognosis and treatment of heart failure spiced with enough physiology

[1] "Heart Failure", by A. M. Fishberg, M.D.; 1937. Philadelphia: Lea and Febiger; Australia: Angus and Robertson Limited. Medium 8vo, pp. 788, with 25 engravings. Price: 50s. net.

and pathology to give it an academic flavour, nor is it a treatise on the physics of the circulation, though many of its pages deal with this aspect of the subject. It is rather an extremely valuable reference book, the study of which will bring the reader back again and again to the consideration of the beginnings of the end state which he witnesses only too often in the patient for whom he can do but little. In its pages, morever, all the relevant literature is summarized, criticized and applied. Frankly, it is not all easy to read; but then the subject is not easy to grasp in all its ramifications, for the author has gone beyond a description of what happens in the body when the heart itself fails, and has also considered other forms of general circulatory failure.

The first six chapters set forth what is known concerning the mechanics of the circulation, and then the author turns to the clinical expressions of failure of the circulatory function, such as dyspnœa of various types, cyanosis and œdema. The last mentioned topic is one which might receive more extended treatment in a textbook which is so encyclopædic as this, for systemic œdema is a much more variable, obscure and often unpredictable phenomenon than is often realized. Pulmonary engorgement and œdema are given two good chapters to themselves, including the description of bronchopneumonia and infarction. It is well that the importance of the latter is stressed, as the occurrence of pulmonary infarction apart from embolism is important and not seldom overlooked. Following these sections are descriptions of the changes in other organs, such as liver, kidneys and brain, which are prefatory to the real "meat" of the book, the chapters on heart failure itself. The information here is full and varied, including accounts of the pathological states existing as revealed by autopsy, the evidences of perverted physiology, and the clinical landmarks. It is not always simply assembled, however, and a student seeking guidance as to the reliability of the clinical evidence of cardiac enlargement, for example, would have to be persistent and patient. It is rather surprising that Bramwell's work on gallop rhythm is not quoted as well as that of other authors. It is natural that the outstanding work of Libman is quoted in numbers of places, for instance in the section on cardiac pain and again in his original and perhaps provocative treatment of atheroma as a systemic disease. Heart failure initiated by insufficiency of the left and right sides of the heart respectively, and by generalized cardiac strain are treated separately; also what the author calls "hypodiastolic" heart failure. Coronary "thrombosis" is surely now almost a demoded term, since actual thrombosis cannot be demonstrated in a large proportion of cases coming to autopsy, and the section on this syndrome (perhaps now well worn but perennially important) might profitably be expanded.

Treatment occupies six chapters which are very well done. The section on digitalis is full and contains many practical details. Digitalis is a drug the indications and pharmacology of which are not sufficiently studied by all, and there are probably few who would not learn something by a careful perusal of this chapter. It is pleasing to read Fishberg's opinion that "the purchase of expensive proprietary digitalis preparations is a waste of money". The indications for and dangers of quinidine are clearly set out later in the book, and the mercurial diuretics are also dealt with carefully. With regard to the latter, caution is again enjoined; we agree with the warning that "even when renal function is good one should administer mercurials with circumspection".

Each chapter has its fairly comprehensive bibliography, and it is obvious that the book is really meant for the reader with a studious mind. In conclusion it may be said that this book is comparable with the author's book on hypertension. It is authoritative after the same fashion, it assembles a vast amount of material which is not readily accessible to the average medical reader, and is a valuable book of reference. It is well produced and clearly printed, and, though its illustrations are few, those X rays films, electrocardiograms and histological sections which have been chosen for reproduction are clear and to the point.

ORGANIC CHEMISTRY.

The appearance of a second edition of Barger's "Organic Chemistry for Medical Students" raises certain questions regarding the preliminary scientific training of medical students.[1] The author of this book takes the attitude quite frankly that the informative content of the course of instruction in organic chemistry is of primary importance. The student must be made acquainted with types of substances which are concerned in the life processes of the human body or which may have some value for the treatment or prevention of disease. A sketch of the field covered by organic chemistry is necessary to show how these selected types fit into the general scheme, but, apart from this, a detailed systematic study of the subject is unnecessary. In fulfilment of the objective outlined in the foregoing sentences an admirably clear and concise presentation of organic chemistry "for medical students" is made.

One cannot avoid the reflection that, although medical schools are frequently attached to universities and make use of the science schools for the preliminary scientific instruction of medical students, the real value of the collaboration is not fully appreciated. Surely the principal advantage of the arrangement lies not in the informative, but rather in the educational value of the courses of instruction. The scientific way of looking at things can be inculcated quite apart from the application of science to medicine. Professor Barger's book so strongly emphasizes the importance of organic chemistry to the study of medicine that little room is left to show what the science of organic chemistry is and how it has developed. For example, no hint is given of how, in the course of years, the existence of organic radicles came slowly to be recognized or how the grouping together of organic substances having similar chemical behaviour has led eventually to the revelation of the whole beautifully systematic plan of this branch of science.

All this, however, is a criticism of the objective of the book and not of its execution, which can only be described as excellent.

Notes on Books, Current Journals and New Appliances.

PARENTERAL THERAPY.

A handsome new book on parenteral therapy,[2] by W. F. Dutton and G. B. Lake, is described as a ready-reference manual of extraoral medication for physicians, dentists, pharmacists, chemists, biologists, nurses, medical students and veterinarians; it weighs two and a quarter pounds. The first part of the book treats exhaustively of the elements of the technique of parenteral therapy; all kinds of injection and infusion, including the injection of sclerosing solutions and the production of spinal and epidural anæsthesia, are described in detail. The chapters on the care of instruments and on puncture of the pericardium and peritoneum, and the picture showing needling of the superior longitudinal sinus are useful. The chapter on local injections of iodized oil for pains of the locomotor system is of great interest. Very good results are claimed for the injection of iodized oil *loco dolenti* in neuritis, sacro-iliac arthritis and amputation neuroma. The terminal three-fifths of the book are given over to a therapeutic index and to pharmacological notes about remedies for parenteral administration.

[1] "Organic Chemistry for Medical Students", by G. Barger, M.A., D.Sc., LL.D., F.R.S.; Second Edition; 1936. London: Gurney and Jackson. Demy 8vo, pp. 261. Price: 10s. 6d. net.

[2] "Parenteral Therapy: A Ready Reference Manual of Extra-Oral Medication for Physicians, Dentists, Pharmacists, Chemists, Biologists, Nurses, Medical Students and Veterinarians", by W. F. Dutton, M.D., and G. B. Lake, M.D.; 1936. London: Baillière, Tindall and Cox. Imperial 8vo, pp. 396, with 90 illustrations. Price: 34s. net.

The Medical Journal of Australia

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All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE MEETING OF THE FEDERAL COUNCIL.

THE meetings of the Federal Council of the British Medical Association in Australia are of such importance to practising members of the medical profession that attention is always drawn to them in the editorial columns of this journal. The meeting recently held in Melbourne was no exception—all States were represented and the discussions covered a wide field. On this perhaps more than on any previous occasion it was evident that the Federal Council does speak for all the Branches of the British Medical Association in the Commonwealth. The council is certainly representative of all the Branches, and the views of each Branch council are always given the most careful consideration. That an executive committee of the Federal Council was appointed without a dissenting voice was proof that the Branch councils trust one another in matters affecting the Australian medical profession as a whole, for it must be remembered that the decisions of the executive committee will be just as binding for the Branches as the decisions of the whole council. In the face of the possible introduction of national health insurance this sign of mutual confidence is most encouraging.

In view of the varying conditions of medical practice in different parts of the Commonwealth, it is not perhaps surprising that the Branches took different views about the formation of an Australian medical association in affiliation with the British Medical Association. The two Branches which thought that an Australian medical association should be formed were those whose members are most affected by government legislation. Most of the others thought that the time was not opportune, but that an effort should be made to secure complete autonomy; in other words, that the Australian Branches should have power to govern themselves. The desire for complete autonomy is shared by all the Australian Branches, and the Parent Body is to be approached with the request that autonomy be granted. The Home Association is becoming more and more aware of the difficulties which have to be faced by the Australian Branches and their Federal Council; we cannot, therefore, think that the Parent Body will fail to make every effort to give the Australian Branches what they need. In the circumstances it is perhaps unfortunate that the Federal Council did not ask long ago that it should have an official representative at the annual medico-political and scientific gatherings of the Association.

The investigation to be made into the incidence and type of tuberculous infection in Australia by the National Health and Medical Research Council is the direct outcome of the Adelaide congress. The choice of tuberculosis as the principal theme for the congress was wise; and it may well be said that if the congress has no other result than this investigation, the gathering will have been well worth while. Some of the other recommendations from the fifth session will also, we hope, be carried into effect. The study of rheumatism as it affects Australia is urgently needed. Whether the National Health and Medical Research Council undertakes or authorizes an investigation into rheumatism or not, the executive committee of the sixth session will do well to consider the advisability of making rheumatism the chief subject for the next congress. The Western Australian Branch is fortunate in its choice of a president for the sixth session; and we

have no doubt that the executive will be just as enthusiastic for the 1940 congress as it was before the proposal to hold a congress in Perth had to be dropped owing to the financial depression. The executive for the 1940 congress will be wise to start its organization at once and to determine the date, so that medical practitioners may make their plans well in advance.

Another matter of great importance discussed by the Federal Council was the terms and conditions of appointment of medical practitioners employed in public medical services. The report of the sub-committee appointed to consider this matter will be awaited with interest. In view of the unsatisfactory reply of the Minister for Defence, it was perhaps unfortunate that the council did not decide to make further representations to him about the necessity for sending an officer to England to study army medical organization and development. This was the subject of a leading article in this journal not long ago, and the urgency of the matter should be stressed again before the Defence Department forgets it altogether.

In this short survey we have drawn attention to the chief subjects discussed at the recent meeting. Every member is asked to read the report and to familiarize himself with the questions at present demanding attention.

Current Comment.

INTERMITTENT VENOUS OCCLUSION IN THE TREATMENT OF PERIPHERAL VASCULAR DISEASE.

Increasing recognition of some of the more serious forms of peripheral vascular disease, Buerger's disease in particular, has stimulated interest in the treatment of these rather depressing conditions. Depressing they often are, since they not infrequently give rise to permanent disability; but earlier diagnosis of occlusive vascular disease and more successful handling of *diabetes mellitus* are altering the picture. Among the various forms of treatment introduced in recent years, the mechanical methods of improving circulation have attracted a good deal of attention. The application of alternate positive and negative pressure has been widely tried, and its use in this country has been encouraging and merits further trial on a wider scale. A simpler method than this has been used by W. S. Collens and N. D. Wilensky, which also seems worth further study.[1] In this an air pump is used to produce periods of compression with alternating periods of release, during which the ordinary atmospheric pressure is restored; this apparatus is connected to a pneumatic cuff which fits round the proximal portion of the limb. The pressure used is merely sufficient to inflate the cuff to a degree necessary to constrict the veins only, thus producing alternate phases of passive venous congestive and reactive hyperæmia.

The rationale of this procedure lies in the fact that there is a demonstrable increase in the arterial circulation during a period of venous congestion produced by occlusion, and much more markedly during an ensuing period of relaxation. Collens and Wilensky quote Lewis and Grant, who claimed that after fifteen minutes of circulatory arrest an increase of as much as 600% could be attained. The chief difference between this method and that used in the better known plan of successive negative and positive pressure is that the former does not require the limb to be encased in an air-tight container, but merely applies pressure to a band which blocks the venous flow high up on the limb. These authors draw upon an experience of 124 cases, which include examples of *thromboangiitis obliterans*, arteriosclerosis of non-diabetic type, and the sclerosing arterial affections of diabetics. At the outset they admit that bed rest alone, with the maintenance of an even temperature and abstention from tobacco, would produce results without further treatment; but most of their patients had already been treated under such conditions before being submitted to intermittent venous compression. They point out also that it is obvious that no alteration of an organically damaged major blood vessel is likely to be produced by any method. Improvement can take place only through the encouragement of collateral circulation or the relief of vascular spasm in a vessel not damaged beyond hope of recovery. That these ends may be attained through vigorous local vaso-dilatation seems a justifiable belief, and the results obtained by Collens and Wilensky support this. They criticize adversely the method of alternate compression and suction applied to a whole limb, on the grounds that the compression phase hinders the development of reactive hyperæmia and favours the spread of infected material from the margins of ulcerated or gangrenous areas. Be this as it may, it is recognized that care is needed in the application of this method. The authors' series includes an encouraging number of successes. Of 34 cases of diabetic ulcer or gangrene, amputation was necessary in 24%, whereas some writers quote 50%. Large chronic varicose ulcers healed readily with this method; great relief was found in cases of embolic obstruction, and in cases of Buerger's disease healing of ulcers with relief of pain was obtained in a large proportion of instances, while the patients' walking

[1] *The Journal of the American Medical Association*, December 25, 1937.

capacity was greatly improved. In the later part of the series a combination of diathermy and venous compression for about one hour continuously was used; this appeared to improve the results. Finally, it is interesting to look back a few years to the time when Bier's passive hyperæmia was a popular method. Has it been forgotten so completely as to be rediscovered? Even so, it is timely to refresh our memories as to the value of a simple method in the treatment of peripheral vascular disease.

DERMATOLOGICAL NEUROSIS.

W. R. JAFFREY holds that cases in which a psychoneurosis complicates an already existing condition are of everyday occurrence.[1] He includes under the term "neurodermatosis" such conditions as generalized pruritus, localized pruritus, such as *pruritus ani* and *vulvæ*, and also pruritus of the scalp, as well as *lichen simplex chronicus*. Other conditions included under this designation are dyshidrosis, urticaria, angioneurotic œdema, neurotic excoriation, or picker's disease, *alopecia areata* and even some types of rosacea. The patients may exhibit easy fatigability, nervous irritability or depression, gastro-intestinal disorder, migrainous headaches and other manifestations. The majority show no organic disturbances, although organic disease may be found. The most difficult conditions to be dealt with are the neuro-complications of a dermatitis caused by an external irritant, including occupational dermatoses. With these must be discussed the common dermatid which has to be distinguished from the original dermatitis. Secondary toxic eruptions and ostiofollicular furuncles must be considered. The dermatids occur most frequently in cases of chronic dermatitis which exhibit some localization and which are often explosive results of over-treatment of the original lesion. These are the most serious reactions associated with external irritant dermatitis and are secondary toxic eruptions. With the development of a primary dermatitis material is absorbed from broken-down cells in the original area. This material is conveyed by the blood stream to distant parts of the body and a secondary eruption is produced. Jaffrey considers that a reasonable explanation is that, owing to the allergic phenomenon taking place in the epidermal cells of the skin, some substance is freed and at once this initiates a cellular or protoplasmic sensitivity of epidermal cells throughout the body, and when the protein, or whatever the material is, of degenerating epidermal cells in the area of dermatitis enters the circulation in sufficient quantity, an explosion occurs which may have focal or general distribution. Jaffrey's explanations are certainly ingenious, whether we accept them or not.

A second type or class comprises neurodermatoses, sometimes designated to include the *lichen simplex chronicus* group. A more liberal interpretation, however, will place neuro-instability, protoplasmic instability and perverted fatigue types in this classification.

In the third type the reaction must not be confused with the artefact produced by the malingerer or that of the psychoneurotic, who produces such lesions for reasons which are not comprehended by himself. Most of the patients exhibit the anæsthetic syndrome. Jaffrey considers that the basis of these widely divergent reactions is a congenital protoplasmic instability. He states that doubtless the primary explosion is caused by contact, inhalation or ingestion during occupational exposure. A patch test, in many of the cases, may determine the cause. Jaffrey does not advocate scratch testing. He insists that only a positive reaction to a test is of value. The greatest care must be taken in handling the patients who develop dermatitis, and tests for allergy should not be made during attacks.

Jaffrey points out that patients suffering from neurodermatitis, when compensation is concerned, are prone to the idea that the continued duration of a dermatitis must be due to the original cause, and they embark on litigation to gain what they think are their proper rights. Some persistently, over long periods of time, haunt their medical advisers or appeal to compensation authorities. It is remarkable how the condition of such patients improves when redress is secured, although previously it seemed aggravated. Aggravation also follows failure to secure favourable consideration. The malingerer with an artefact is much more clever and needs careful handling. Here the lesions are generally on accessible parts of the body and may vary so greatly as to mimic many conditions, but they do not have the definite characteristics of any. Patients of the perverted fatigue type generally present the simple neurodermite or dyshidrotic type of lesion. They are looking for relief of their trouble rather than for sympathy. They seek the advice of a multitude of doctors and have all kinds of examinations. Their teeth and tonsils are removed; yet they remain mentally tired. They have more or less real worry. Relief from mental strain is their best remedy. The patient who develops neurodermatitis becomes the subject of chronic dermatitis, with dermatological neuroses, and exhibits definite neuro-instability. The skin manifestation is merely the explosion point of nervous-mental exhaustion or perverted fatigue. In some such cases, as Jaffrey observes, recovery is phenomenal. Jaffrey's contribution will be a welcome addition to our knowledge of the integumentary rashes which furnish such perplexing problems, especially in workers' compensation courts. Self-inflicted skin lesions, which have been ambiguously designated "autophytic dermatitis", are far from being uncommon. H. MacCormac has well dealt with such conditions;[1] his article will amply repay careful perusal.

[1] *The Canadian Medical Association Journal*, November, 1937.

[1] *The British Medical Journal*, December 11, 1937.

Abstracts from Current Medical Literature.

OPHTHALMOLOGY.

Specific Diagnosis of Tuberculous Eye Diseases.

W. Rohrschneider (*Klinische Monatsblatt für Augenheilkunde*, Volume XCIX, 1937, page 682) states that everyone who has investigated tuberculous disease of the eye will have realized the difficulty of proving the nature of the disease by clinical methods. As neither the presence of tuberculous infection elsewhere, nor proof of tuberculous bacillæmia, nor a reaction to Mantoux's intracutaneous test is sufficient evidence of tuberculosis, the author has looked for some local ocular reaction as a positive proof after the injection of old tuberculin. He admits that differences in technique may account for the variance in the percentages of local reaction and that the absence of a local reaction cannot be regarded as evidence that tuberculosis is not present. As small changes can be overlooked so easily, he asks whether we can find a better criterion than an alteration in intraocular pressure, as suggested by Samojloff. Mexina considered a positive reaction to be an increase in tension two hours after the injection, followed by a decrease which lasted at least twenty-four hours, so that after this period the tension was lower than before the injection. In non-tuberculous disease there is no alteration in tension. There are two reasons why a fall in tension cannot be regarded as a proof of tuberculous infection. One is that a spontaneous variation may occur in inflamed eyes. The other is that in some cases with a certain local reaction there has been little or no fall in tension. At present, apart from an obvious clinical ocular reaction, there is no one test that by itself is satisfactory.

The Monochromatic Light from the Sodium-Vapour Lamp in Ophthalmoscopy.

H. Serr (*Archiv für Ophthalmologie*, Volume CXXXVII, 1937, page 636) states that the monochromatic light from a sodium-vapour lamp is of definite value in the practice of ophthalmology. Just as red-free light permits a detailed view of retinal fibres, vessels and hæmorrhages, so sodium light renders the chorioid visible, even in the most pigmented fundi and even when the media are far from transparent. The light from a sodium-vapour lamp with a wave-length of 589μ is superior to the short-wave visible light, because there is less loss by absorption when it is passing through the clear areas lying within the relatively opaque media, and because the yellow pigment of the lens can have no filtration effect on this monochromatic yellow light. In addition, because the waves are longer, there will be less reflection and curvature of the yellow light, and so opacities in the media will prove less obstructive. In the majority of cases the chorioidal vessels can be easily distinguished as dull black strands in a yellow-grey fundus. The optic disk appears grey, and the more congested it appears in ordinary light, the greyer it is by this light. The yellow pigment is not visible. Even when the opacities of the media rendered the disk very difficult to see in ordinary light, its details could be discerned by sodium light. It is possible to see how the vorticose veins narrow as soon as the slightest pressure is made on the sclera. These veins appear as black sacs at the equator. The differentiation of retinal tears from a fresh hæmorrhage is aided by this illumination. The latter appear jet black and the former are grey on a greyish background. For this reason small tears are difficult to see, but larger tears are very distinct, as the chorioidal pattern shows clearly through them. In certain conditions this light is superior to others for transillumination.

Results of Cyclo-Diathermy in Glaucoma.

A. Vogt (*Klinische Monatsblatt für Augenheilkunde*, Volume XCIX, 1937, page 9) has for two years been experimenting with diathermy of the ciliary body in animals and in almost hopeless cases of glaucoma. He considers that this method of treatment is worth while when other operations have failed, in cases of glaucoma in aphakic eyes, and when there is complete and persistent obliteration of the anterior chamber, whether a lens is present or not. The disadvantages of a trephine or an iridencleisis are not present. They are, according to the author, primary or secondary infection or even sympathetic ophthalmia. He admits that there are certain risks from diathermy, but that this heroic measure is justified by the gravity of the condition. The chief dangers are damage to the cornea and the lens, and they can be avoided if the puncture is not made too close to the corneal limbus and if the needle is not more than 0·5 millimetre long and 0·18 to 0·2 millimetre thick. If the puncture is made nearer than 2·0 to 2·5 millimetres to the limbus, there frequently follow corneal opacities, deep marginal keratitis and ulceration. Iridic irritation with synechiæ and a hæmorrhage into the anterior chamber eight to fourteen days later may occur. The author reports cases in which the tension was reduced at once and the anterior chamber quickly deepened. The hypotension persists for many months at least. He uses a local anæsthetic and makes a circular incision four to five millimetres from the limbus. The strength of the current in his series of approximately fifty cases was 60 to 70 milliampères. He sutures the conjunctiva very carefully. Gas bubbles which may appear in the anterior chamber are soon absorbed. He reported an eighty-year-old patient whose left eye had been trephined unsuccessfully twice. Precipitates appeared on the posterior surface of the cornea. These and the hypertension disappeared after cyclodiathermy. A cataract extraction was performed later with satisfactory results. The author considered that the hypotension was due to damage to the ciliary body. The physiological production of aqueous humour is too great in a glaucomatous eye, and by this method the production is reduced. In one case atropine failed to produce any rise in tension after operation.

Treatment of Dendritic Keratitis with Quinine Bisulphate.

S. Selenger (*Archives of Ophthalmology*, June, 1937) had good and quick results in eleven patients suffering from dendritic corneal ulcers with quinine bisulphate. An ointment of 2% quinine bisulphate was applied to the conjunctival sac twice a day by the patient. The subjective symptoms became less from the beginning, possibly owing to the anæsthetic action of quinine on mucous surfaces. The same treatment was tried with good result in a case of *herpes zoster* with corneal involvement.

Prognosis of Uveal Sarcoma.

F. von Papolczy (*Klinische Monatsblatt für Augenheilkunde*, Volume XCIX, 1937, page 518) has made an analysis of all eyes enucleated for uveal sarcoma between 1913 and 1932, and has followed the patients for at least five years. The fate of 112 of the total number of 180 patients is known. In 43% women were affected, and in 43% the right eye was affected. The author has never seen a bilateral case. The disease was most common between fifty and sixty years. The patients' ages varied from twenty to seventy-eight years. Sixty-two of the patients had died, 70% of these from metastases. Of fifty patients in the first stage, 28% had died from metastases and 57% were living. For forty-nine cases in the second stage the figures were 37% and 40%; and for thirteen cases in the third stage they were 92% and 8%. Metastases are particularly apt to occur in the first five years. After ten years the danger is practically negligible. The author agrees with Wintersteiner in stating that the blood vessels of the tumour have no walls of their own. He demonstrated the entrance of tumour cells into the blood vessels in serial sections. As the cells are broken off by the blood stream the lumina enlarge. The infiltration first drags the vessels apart and then affects the vessel walls. The capillaries are attacked first; the arteries are protected by elasticity. At first the organ is able to protect itself, the cells in the blood stream or in a small cluster being destroyed.

This immunity varies in different people, but has always gone by the third stage. The author holds von Hippel's view that radiological treatment is not necessary, but can do no harm if the tumour has not broken through the ocular wall; if it has, radiological therapy is necessary.

OTO-RHINO-LARYNGOLOGY.

Subglottic Cancer of the Larynx.

STCLAIR THOMSON (*The Journal of Laryngology and Otology*, December, 1937) discusses subglottic cancer of the larynx and concludes that the early symptoms may be latent or indefinite; that the condition is generally well advanced before its extension reaches the free edge of the cord, causing change of voice; and that this may be the first complaint which impels the patient to seek advice. The condition is often overlooked. Its detection and the determination of its full extent, by direct and indirect laryngoscopy, may be incomplete. Amongst the first early symptoms may be intermittent disturbance of voice or partial paresis of one cord. It tends to spread upwards to invade the cord, and also sideways so as to extend round below the commissure, even without invading it, to the opposite subglottic area. It should be suspected and looked for whenever there is any flagging in movement of a cord and also when this occurs without a visible lesion on its surface sufficient to explain this paresis. When the condition is limited to one side, when movement is not impaired or only slightly affected, and when the anterior commissure as well as the arytenoid has not been invaded, a lasting cure can be obtained by partial laryngectomy carried out through the laryngofissure route. This requires not only the removal of one thyreoid ala, but sometimes the exposure of the inner surface of the cricoid ring and even resection of it. When a subglottic cancer has extended round to the opposite side or has spread to the arytenoid, and nearly always when the anterior commissure has been invaded, a complete laryngectomy is indicated. The choice seems to lie between these two alternatives. The complete extent of a subglottic growth cannot be correctly judged until the larynx has been split and its interior inspected. The extension is generally greater than was anticipated. This step may be followed by an endolaryngeal excision, if a satisfactory margin in all directions can be secured. Or it may show the necessity of proceeding to a laryngectomy. For patients whose age, health or prejudice forbids a complete laryngectomy, and for those in whom this does not promise success, treatment by irradiation should be considered. In such cases it should be borne in mind that the full extent of these growths is often misjudged and that it is difficult and uncertain to be able to expose to radiation a growth which may descend as far as the inside of the cricoid cartilage or lower. An unsuspected extension to the opposite side may escape treatment by radiation. This may help to explain some of the failures met with after this form of treatment. A study of such cases also helps to explain the failures which sometimes occur in intrinsic cases not carefully selected for removal by the laryngofissure route. If this route is limited to intrinsic cancer of a mobile cord, with both extremities free from the disease, a lasting cure should be obtained in all cases and without an operative death. When the subglottic growth has passed to the opposite side, or has invaded the commissure, or reached the arytenoid, or invaded and fixed the whole cord, a total laryngectomy is indicated.

Carcinoma of the Bronchus.

F. C. OMEROD (*The Journal of Laryngology and Otology*, November, 1937), in a paper dealing with the pathology and treatment of carcinoma of the bronchus, presents a summary based on one hundred consecutive cases, in each of which a portion of the growth was removed through the bronchoscope and its malignant nature demonstrated. The progress of thoracic surgery has increased the proportion of patients for whom radical removal is possible, and the number of successful cases of lobectomy and pneumonectomy is steadily increasing. In the large majority of patients seen the condition was, however, too far advanced to permit of these measures. During the past eighteen months at the Brompton Hospital radon seeds have been inserted directly into the tumour mass. The method has the advantages that the seeds can be introduced into the tumour mass itself instead of being placed alongside it in the bronchial lumen; that they can be distributed in different parts of the growth; and that they are more likely to remain in position. It is possible to pass the seeds through the boundaries of the bronchus into a mass growth, into secondary bronchi which will not admit a container, and into the upper lobe bronchus, into which it is almost impossible to introduce a container. The patient is kept in hospital for two or three days; but there is rarely any reaction and the patient is very little disturbed. As a routine measure the bronchoscopic examination and the insertion of radon are performed under local cocaine and adrenaline anæsthesia. The patient is seen and an X ray examination is made at the end of one month and again at the end of two months. After the second month a further insertion of a similar number of seeds is carried out. The patient is then seen in two months, and in some cases a third insertion is carried out at the end of four or five months. The results of treatment in these cases are not too discouraging when the type and inaccessibility of the growths are considered. The majority of patients have a history of symptoms of from four to nine months; many have a longer one. It is probable that the growth is present for some considerable time before symptoms become obvious, and it is difficult to estimate how long the tumour has been in existence. In many of these cases there is a parenchymatous extension as well as the intrabronchial tumour; bronchi are obstructed and areas of lung are infected and atelectatic, and in many instances metastases have occurred in the mediastinal glands and other viscera. The object of the treatment is twofold: to destroy the growth, to open up the bronchus and to drain and aerate the lung distal to the obstruction. It is considered at the Brompton Hospital that when there is not a reasonable prospect of complete removal by surgical measures, radon treatment should always be carried out, except when the patient is obviously dying.

Chronic Purulent Otitis Media.

ROBIN HARRIS (*Archives of Otolaryngology*, November, 1937) claims satisfactory results in the treatment of chronic suppurative *otitis media* by the use of the powdered extract of *Carica papaya* or pawpaw. A solution made the moment before is instilled into the ear while the patient is prone and is allowed to remain for a few seconds and then the ear is wiped dry. The solution penetrates to the far crannies better than powder. This vegetable digestant cleans the surface of visible pathological tissue, and after a few treatments, in the ordinary case, leaves a dry ear. The solution may be injected into the Eustachian tube, and the results in empyema of the Eustachian tube have been satisfactory.

Use of Urea in Treatment of Chronic Otitis Media.

PAUL S. MERTINS, JUNIOR (*Archives of Otolaryngology*, November, 1937) discusses the use of urea in the treatment of chronic *otitis media*. Cleanliness is necessary to remove the necrotic debris, which retains moisture, blocks drainage, produces adhesions by its irritative action on delicate tissues, and forms a fertile soil for the many types of bacteria and fungi which often complicate chronic *otitis media*. The use of an antiseptic is of secondary importance. Urea in aqueous saturated solutions or in crystalline form, by its power of dissolving necrotic debris, removes the chief deterrent to healing in many types of chronic aural infection. It is almost totally non-irritating to living tissue. It is mildly bactericidal to many forms of organisms, especially those producing putrefaction. It almost immediately eradicates all odour, without producing another odour. It is inexpensive.

British Medical Association News.

MEETING OF THE FEDERAL COUNCIL.

A MEETING of the Federal Council of the British Medical Association in Australia was held at the Medical Society Hall, Albert Street, East Melbourne, on February 10, 1938, SIR HENRY NEWLAND, the President, in the chair.

Representatives.

The following representatives of the Branches were present:

New South Wales: Dr. George Bell, O.B.E., Dr. W. F. Simmons.
Queensland: Dr. D. Gifford Croll, C.B.E., Dr. T. A. Price.
South Australia: Sir Henry Newland, C.B.E., D.S.O., Dr. A. F. Stokes.
Tasmania: Dr. W. E. L. H. Crowther, D.S.O.
Victoria: Dr. J. Newman Morris, C.M.G., Dr. F. L. Davies.
Western Australia: Dr. D. D. Paton, Dr. F. W. Carter (as substitute for Dr. D. M. McWhae).

The President welcomed Dr. A. F. Stokes and Dr. W. F. Simmons, the two new members of the Federal Council; and extended to Dr. J. Newman Morris the congratulations of the council on the honour recently conferred on him by His Majesty the King.

Minutes.

The minutes of the previous meeting of the Federal Council, of August 19 and 20, 1937, which had been circulated among members, were taken as read and signed as correct.

Appointment of Office-Bearers.

The secretary announced that only one nomination had been received for the office of president, that of Sir Henry Newland. Sir Henry Newland was declared to be elected as president, and thanked the members for his election.

Only one nomination had been received for the office of vice-president, that of Dr. J. Newman Morris. Dr. Morris was declared elected.

Only one nomination had been received for the office of honorary treasurer, that of Dr. George Bell. Dr. Bell was declared elected.

Appointment of an Executive Committee.

The council had before it a notice of motion by Sir Henry Newland to the effect that the Federal Council should meet quarterly, or alternatively that an executive committee should be formed. Sir Henry Newland, in moving the motion from the chair, said that he did not think that an executive committee of six (one member from each of the several Branches) would meet the case. He thought that the subject of national health insurance should be considered and that it was necessary to look beyond the immediate needs of the present to the time when the insurance bill would become the act. It might, he thought, be necessary to appoint in addition a national insurance health committee. The motion was seconded by Dr. J. Newman Morris, who thought that both an executive committee and a special health insurance committee were necessary.

It was pointed out that according to the Memorandum and Articles of Association two representatives from two States would be a quorum of the executive committee and would have power to act. Unfortunately two members from one State could not act, even if proxies were given from members in other States.

Dr. George Bell thought that an executive committee should be formed first and that an insurance health committee might perhaps be formed later on. In this view Dr. D. D. Paton concurred.

It was resolved that an executive committee should be formed.

An executive committee was then elected. Sir Henry Newland, representing South Australia, was an *ex officio* member; the following additional members were elected: Dr. J. Newman Morris (Victoria), Dr. George Bell (New South Wales), Dr. T. A. Price (Queensland), Dr. D. D. Paton (Western Australia), Dr. W. E. L. H. Crowther (Tasmania).

Dr. J. Newman Morris raised the question as to whether the executive committee would have power to make decisions and whether the decisions would be binding on the Branches.

Sir Henry Newland pointed out that according to the Memorandum and Articles of Association the executive committee had all the powers of the full council and that its decisions would be binding.

Finance.

The financial statement as at December 31, 1937, was presented. The statement included the Federal Council account and the Australasian Medical Congress (British Medical Association) fund account. The statement was received.

Distinguished Visitors passing through Western Australia.

A letter was received from the Western Australian Branch asking that its council might be informed when distinguished visitors from overseas were passing through Perth, so that proper entertainment might be provided for them. The secretary stated that steps would be taken to comply with the request. The letter was received.

Service to Unemployed in New South Wales.

A communication was received from the New South Wales Branch for the information of the Federal Council, setting out the conditions of service by medical practitioners to unemployed persons. The service had been inaugurated by the Government of New South Wales, and the terms of service were practically the same as those of the common form of agreement of friendly society lodge practice. The communication was received.

The Ninth Australian Cancer Conference.

A letter was received from the Director-General of Health, Commonwealth Department of Health, asking the Federal Council to nominate representatives to the ninth Australian Cancer Conference, to be held in Sydney from April 5 to 8, 1938. It was resolved that Sir Henry Newland and Dr. George Bell should be the representatives.

Information regarding Applicants for Pensions.

A letter was received from the Victorian Branch asking what fee should be charged by medical practitioners to authorities controlling pensions for supplying information about applicants for pensions. It was resolved that these authorities should be asked to adopt the same procedure as the Repatriation Department. When the Repatriation Department desired to obtain a report on an applicant for war pension from a medical practitioner, it forwarded to the practitioner the applicant's authority to furnish the report, and stated that a fee of ten shillings would be paid for such report.

Status of Members of more than Fifty Years' Standing.

A communication was received from the Queensland Branch drawing attention to the decision of the annual meeting of the British Medical Association, 1937, according to which members of more than fifty years' standing should be entitled to membership without subscription. Some of the Branches were in agreement with this provision, but it was pointed out that the supplying of THE MEDICAL JOURNAL OF AUSTRALIA to such members was involved. It was resolved that the matter should be referred to the directors of the Australasian Medical Publishing Company, Limited.[1]

[1] At a meeting of the directors of the Australasian Medical Publishing Company, Limited, held subsequently, it was resolved that THE MEDICAL JOURNAL OF AUSTRALIA should be supplied free of charge to members of the Association of more than fifty years' standing who were granted the privilege of being members without the payment of subscription.

Teaching Appointments in England.

For the information of members the secretary read communications received by him from the Director-General of Health regarding a vacant readership in medical parasitology at the London School of Hygiene and Tropical Medicine, and the vacant chair of medicine at Saint Bartholomew's Hospital Medical College, London. This information had been sent to the Branches.

Air Mail Postage of "The British Medical Journal".

The secretary read a letter which he had received from the secretary of the board of directors of *The British Medical Journal*, stating that the board had taken up the matter of the dispatching of *The British Medical Journal* to Australia by air mail and that, should the facilities offered by the Empire mail scheme be extended to Australia, *The British Medical Journal* would be subject to a postage rate of one penny halfpenny per half ounce, when it would be eligible for transmission as first class mail by the services provided under the scheme. The average cost of postage per journal would be two shillings and tenpence halfpenny.

Financial Assistance to Medical Practitioners.

After the secretary had read a letter from a member who wished to know whether any funds were available for loans to be made to medical practitioners who wished to purchase practices, Dr. W. F. Simmons raised the question of the establishment of an emergency fund which would be used to help practitioners who had been affected by government legislation. After general discussion it was resolved:

That a committee be appointed to consider and report as to:

(*a*) the advisability and practicability of the Federal Council establishing and administering a Federal emergency fund, which shall have for its object to assist in maintaining the interests of members of the medical profession in Australia in their relations with governments and organized bodies of the community, or in consequence of the activities of governments or organized bodies of the community;

(*b*) the persons who may be eligible for membership of the fund;

(*c*) the method that shall be adopted for securing membership of the fund;

(*d*) the minimum subscription or donation that shall entitle to membership benefits;

(*e*) how the fund shall be controlled and in whom the assets of the fund shall be vested;

(*f*) the purposes for which the fund shall be applied;

(*g*) provisions considered necessary to secure the solvency of the fund;

(*h*) any other matter or provision deemed necessary for the successful establishment and maintenance of the fund.

Dr. W. F. Simmons, Dr. George Bell and the secretary were appointed members of the committee.

The Eradication of Hydatid Disease from Australia.

A memorandum was received from the Victorian Branch on the eradication of hydatid disease from Australia. It was resolved that the memorandum should be sent to the National Health and Medical Research Council.

Medical Officers' Relief Fund (Federal).

Dr. George Bell, on behalf of the trustees, submitted an interim report of the Medical Officers' Relief Fund (Federal). He said that fourteen loans were in existence; in only one instance had it been necessary to bring pressure on a defaulting debtor. The report was received and adopted.

British Medical Association Scholarships and Grants.

The secretary reported that the usual correspondence had taken place with the assistant secretary of the Parent Body regarding scholarships and grants. Three applications had been received from Australian practitioners, but referee statements were not yet to hand.

Annual Meeting of the Association, 1938, Plymouth.

In a discussion on the annual meeting of the Association to be held at Plymouth in July, 1938, the view was expressed that an official representative of the Federal Council in Australia should be chosen for each annual meeting. Each of the several Australian branches had its representative, but there was no one who had authority to speak for the Federal Council and for the Branches collectively. Both Canada and South Africa had special representatives. It was resolved that the Parent Association should be approached with the object of having such an appointment made.

Australasian Medical Congress (British Medical Association).

Resolutions from the Fifth Session.

The council had before it several resolutions which had been adopted at the fifth session of the Australasian Medical Congress at Adelaide in August, 1937.

The Section of Pædiatrics forwarded the following resolution:

That the Pædiatric Section of congress recommend that every effort should be made by the executive of the British Medical Association to further the application of the scientific facts of normal child development, mental and physical, for the benefit of pre-school children in all the States of the Commonwealth.

It was resolved that the resolution should be sent on to the sections of pædiatrics in the several Branches of the Association in the Commonwealth.

A resolution was also received from the Section of Pædiatrics and the Section of Public Health, Preventive Medicine and Tropical Hygiene as follows:

That the combined Public Health and Pædiatric Sections of congress recommend that a well-organized scheme for the ascertainment and supervision of patients with rheumatic infections, including a central bureau, should be set up in each State of the Commonwealth.

During discussion on this resolution it was pointed out that the whole subject of rheumatism was being investigated by the National Health and Medical Research Council. In these circumstances it was resolved that no further action should be taken.

A further resolution, that the subject of rheumatism should be discussed at the plenary session of the next congress, was referred to the executive committee of the sixth session.

A communication was received from the Section of Ophthalmology suggesting that the Federal Council should form a subcommittee of oculists from each State to draw up provisions for the possible uniformity of State laws in respect to compensation resulting from eye injuries, and also to consider clinical standards for the guidance of oculists in carrying out their duties of estimating percentage loss of vision. It was thought that these were questions which could be well considered by the Federal Association of Ophthalmologists, when constituted. A communication was also read in which ophthalmologists sought the approval of the Federal Council for the establishment of a Federal Association of Ophthalmologists within the British Medical Association in accordance with the rules recently adopted for the formation of special associations within the professsion. In discussion attention was drawn to the fact that in New South Wales ophthalmic surgeons did not belong to a section of the New South Wales Branch, but had for many years belonged to the Ophthalmological Society of New South Wales. One

member, however, pointed out that there was no reason why ophthalmologists in New South Wales should not belong to two bodies if they so desired. The president reported that he had given his approval to the formation of a special section, and the President's action was confirmed.

The Trade Exhibits Committee of the fifth session of congress also made certain recommendations for the conduct of future congresses; these were referred to the executive committee of the sixth session.

The executive committee of the fifth session made certain recommendations with regard to the appointment of patrons and office-bearers. The executive quoted a vice-regal authority to the effect that the Governor of the State in which the congress was held should be sole patron. It also recommended that the consent of nominees whose names were submitted from the several Branches to act as office-bearers should be obtained before the names were sent on to the executive committee. It was thought that in this way much unnecessary delay and correspondence might be avoided. After discussion it was resolved that Dr. George Bell and the Secretary should be appointed a subcommittee to consider the recommendations and report to the next meeting of the council.

The Sixth Session.

A letter was received from the Western Australian Branch nominating Dr. D. D. Paton as president of the sixth session, to be held in Perth in 1940. The recommendation of the Branch was adopted unanimously, and Dr. Paton thanked the members of the council for his election.

It was resolved that the treasurer should be empowered to send to the executive of the sixth session from congress funds a grant of one hundred pounds as soon as application was made for it.

Organization of the Medical Profession in Australia.

At the previous meeting of the Federal Council a resolution was adopted in which it was stated that in the opinion of the Federal Council the time had arrived to explore the possibility and desirability of forming an Australian medical association, affiliated with the British Medical Association. The matter was referred to the Branch councils for their consideration.

The secretary reported that the South Australian and the Western Australian Branch councils had expressed the view that the Australian Branches needed increased autonomy and that the Parent Body should be approached with this object in view. The reply of the Victorian Branch was on practically the same lines. The New South Wales Branch council was opposed to the formation of a new association. It thought that increased autonomy should be granted to the Branches, and expressed the further opinion that the *per capita* payment of the Branches to the Federal Council should be ten shillings *per annum*. Both the Tasmanian and the Queensland Branch councils were in favour of the formation of an Australian medical association.

In the discussion which followed the reading of these replies, Dr. J. Newman Morris laid emphasis on the difficulty experienced by Branch councils in securing alterations to their rules. He referred to one instance in which ten months had elapsed before finality was reached, and in another instance as long a period as three years passed before agreement was reached regarding an alteration and the alteration was effected.

The Queensland representatives spoke at some length on the necessity for having a body with which governments would be compelled to deal. It was pointed out that this could not be done under the constitution of the British Medical Association, and the suggestion was made that it might be useful in certain States to form a body analogous to the Medical Society of Victoria.

Dr. J. Newman Morris moved:

> That this Federal Council, being the representative body of the Branches of the British Medical Association in Australia, realizing by experience the need of complete autonomy and powers for regulating the actions and promoting the interests of the organized profession in the Commonwealth, requests the Central Council to amend its Memorandum and Articles of Association and By-laws so as to give to the organized profession in Australia autonomy.

Dr. T. A. Price and Dr. D. Gifford Croll moved and seconded an amendment to the effect that further consideration should be given to the formation of an Australian medical association. The amendment was lost and the motion was carried.

Formation of Special Associations within the Association.

The secretary referred to correspondence with the council of the Parent Body and with the solicitors of the Federal Council regarding the formation of special associations within the profession. Before the machinery for the formation of such associations could be completed, it would be necessary for the council to pass a special resolution dealing with the matter at an extraordinary general meeting. This was done at 4.30 p.m. on Thursday, February 10, 1938.

Principles of Medical Ethics.

Consideration of the principles of medical ethics was deferred pending the decision by the Parent Body in regard to the question of autonomy.

Uniform Medical Registration.

At the previous meeting of the Federal Council consideration was given to the subject of uniform medical registration for Australia. The council at that time had before it a majority report and a minority report drawn up by a subcommittee of the council. The majority report was presented in the form of a bill ready for introduction to Parliament. At its last meeting the council decided that an epitome of the report should be sent to each Branch council and that the Branch should be asked to indicate what degree of autonomy was required in its State. The secretary reported that replies had been received from the Western Australian, the Queensland, the New South Wales and the South Australian Branches. After discussion the council resolved, on the motion of Dr. D. D. Paton:

> That in the opinion of the Federal Council legislation is necessary throughout the Commonwealth to provide:
>
> (*a*) a common standard as to qualifications entitling to registration;
>
> (*b*) a common rule as to procedure and grounds for deregistration and that deregistration in one State shall deregister in all States;
>
> (*c*) a common rule as to procedure for reinstatement and that reinstatement in the State which deregistered him shall *ispo facto* reinstate for all States;
>
> (*d*) uniformity in the constitution of State medical boards, and that the personnel of such boards shall consist of medical practitioners—
>
> (i) nominated by the Minister charged with the administration of the *Medical Act* (one of which members shall be chairman of the board),
>
> (ii) nominated by the Faculty of Medicine of the university (if in the university of the State there is a medical school), and
>
> (iii) nominated by the body representing the practising medical profession, and approved by the Governor-in-Council;
>
> (*e*) that the term for which members shall be appointed shall be one of six years;
>
> (*f*) that there shall be uniform methods of dealing with unqualified medical practice throughout the Commonwealth.

Precautions against Gas Attacks.

At the previous meeting of the Federal Council the subject of taking precautions against gas attacks in warfare was considered at the instance of the Queensland Branch, and it was resolved that the Federal Government should be asked what its policy was in regard to the protection of the civil population in gas attacks. The secretary reported that the Minister for Defence had replied pointing out that conditions in Australia were different from those in other countries. It was also stated that the several States had undertaken to prepare plans and to devise precautions against gas attacks. The correspondence was received.

The Possible Influx of European Medical Practitioners into Australia.

Further reference was made to the possible influx of European medical practitioners into Australia. At the previous meeting of the Federal Council it was determined that letters should be written to the General Medical Council of Great Britain, to the Scottish Colleges and to the Parent Body. The secretary reported that no reply had been received from the General Medical Council. The Scottish Colleges, however, had stated in reply that they would not alter their present arrangement. The Secretary of the Parent Body had written stating that the danger of an invasion on medical practice by foreign graduates had been averted in Great Britain by the action of the Secretary of State for Home Affairs in refusing to grant to foreign doctors permission to reside in the country for the practice of medicine, and inquiring whether the Federal Council could not persuade the appropriate authorities to take similar action.

Dr. W. E. L. H. Crowther drew attention to recent legislation enacted in Tasmania. According to the new Tasmanian act it was necessary that any person applying for registration should be in possession of a qualification obtained in a country which had reciprocity with Tasmania, and that the whole of the course of study entitling the holder to his diploma should have been carried out in the country granting the qualification. When Dr. J. Newman Morris suggested that it might be advisable to try to secure the passage of similar legislation in States other than Tasmania, it was pointed out that a person who had, for example, done half his course of study in Melbourne and half in Sydney would not be eligible for registration in Tasmania. It was resolved that a committee should be appointed to draft a clause which would be suitable for all States.

The Provision of Civil Aviation Landing Grounds.

At several previous meetings of the Federal Council the provision of suitable civil aviation landing grounds was discussed. The secretary reported that further correspondence had passed between the Federal Council and the Minister for Defence and the several Ministers for Health of the Commonwealth and the States. He pointed out that an announcement had been made that the sum of £10,000 would be made available to local authorities for this purpose. The Australian Inland Mission would also continue to provide landing grounds and wireless transmitting sets for the use of people in the backward areas.

Repatriation Department.

At the meeting of the Federal Council in January, 1937, discussion took place on the procedure of the Entitlement Appeals Tribunal of the Department of Repatriation. Divergent views were expressed. Dr. George Bell and Dr. A. J. Collins were at that meeting appointed a subcommittee to inquire into the procedure of the Entitlement Appeals Tribunal and to report to the Federal Council at a later date. Dr. George Bell submitted a report from Dr. Collins and himself. In this report the constitution and the mode of procedure of the tribunals were discussed. Among the conclusions arrived at by the subcommittee was the statement that it would be in the interests of the community and to the advantage of all concerned if a medical practitioner were a member of the tribunal. After discussion the report was adopted.

The Prevention of Blindness.

Further reference was made to the prevention of blindness and to the action taken on this subject by the National Health and Medical Research Council. The Federal Council also had before it a report by Dr. Bruce Hamilton and Dr. W. Counsell, of Hobart. The secretary reported that he had communicated with the Branches and that he had forwarded to them a copy of Dr. Hamilton and Dr. Counsell's report, together with a summary and recommendations of the Committee on the Prevention of Blindness, and requesting that arrangements be made for a survey of the blind in each State.

The General Secretary's Visit to Tasmania.

The general secretary, Dr. J. G. Hunter, reported to the Federal Council on his visit to Tasmania in September and October, 1937, and explained the conversations which he had had with the Premier and the Minister for Health. The report was received.

Terms and Conditions of Service in Public Medical Services.

The secretary reported that he had corresponded with the several Branches regarding the terms and conditions of appointment of medical practitioners employed in public medical services. The secretary pointed out that there was considerable divergence in the salaries offered for whole-time service by medical officers. In the following discussion the view was expressed that if possible some standard should be adopted. The secretary read the replies to his inquiries received from the Branches. It was resolved that Dr. F. L. Davies and Dr. J. Newman Morris should be a subcommittee to report on the matter.

The Australian Army Medical Corps.

At the last meeting of the Federal Council further consideration was given to the proposal that an officer of the Australian Army Medical Corps should be sent to England to study military medical matters. At that meeting it was resolved that the authorities should be again approached on the subject and that emphasis should be laid on the urgent necessity for the study of problems altogether unconnected with gas warfare. The secretary reported that he had written to the Minister for Defence and had been informed that the matter would receive consideration when the estimates were being prepared for the financial year. The correspondence was received.

The National Health and Medical Research Council.

The secretary reported that he had conveyed to the Minister for Health and to the Director-General of Health of the Commonwealth the resolutions passed at the fifth session of the Australasian Medical Congress (British Medical Association), Adelaide, 1937. He stated that the National Health and Medical Research Council had welcomed the resolutions of congress. A scheme had been adopted (*a*) to ascertain the rate of infection by tuberculosis, (*b*) to determine the reason for the high percentage of infections occurring in young women, (*c*) to determine the mortality from tuberculosis of bovine origin. This scheme was in the hands of a tuberculosis committee.

The council received the report of Dr. J. Newman Morris on the meetings of the National Health and Medical Research Council.

National Health Insurance.

The Federal Council held a general discussion on national health insurance.

Date and Place of the Next Meeting.

The determination of the date and place of the next meeting was left in the hands of the President.

Votes of Thanks.

A vote of thanks was accorded to the council of the Victorian Branch of the British Medical Association for having provided accommodation for the meeting and for its hospitality.

A vote of thanks was also accorded to Sir Henry Newland for having presided at the meeting.

MEDICO-POLITICAL.

A meeting of the Victorian Branch of the British Medical Association was held at the Medical Society Hall, Albert Street, East Melbourne, on February 2, 1938, Dr. F. L. Davies, senior Vice-President, in the chair.

Financial Statements.

Dr. C. H. Mollison, Honorary Treasurer, presented the statement of receipts and expenditure of the Branch and of the Medical Society of Victoria for the year ended December 31, 1937.

Dr. Mollison said that he had to report that on the year's transactions the expenditure exceeded the receipts by £356 3s. 3d. after accounting for two amounts held in suspense (£120 15s. 8d. for the Wood Jones Portrait Fund and £10 for a cancer research fund, which would subsequently have to be disbursed). With the overdrafts with which the year was commenced (£122 0s. 10d. in respect of the British Medical Association Account and £57 0s. 8d. of the Medical Society of Victoria) the accumulated deficiencies at overdraft with which they would commence 1938 was £535 4s. 9d. To clear this deficiency and to enable the Association to pay its way, the Branch, on the recommendation of the Council, had recently agreed to increase the subscription rates—metropolitan members by 5s. 6d., country members and whole-time medical officers by 5s., and junior members by 2s. 6d. The deficiency was accounted for not by a falling off of subscriptions, but through the increased activities of the Association. The subscriptions, Dr. Mollison was pleased to report, showed an increase over the previous year of £96 14s. 9d., being £5,834 2s. 3d. for 1937, as against £5,737 7s. 6d. for 1936. The membership of the Branch and of the Medical Society of Victoria stood at 1,390, constituting a record. Items of expenditure which showed an increase over 1936 were: salaries, £152 1s. 10d.; *The British Medical Journal*, £49 4s. 1d.; The Medical Journal of Australia, £34 7s. 6d.; library, £24 8s. 10d.; rebates to subdivisions, £9 10s. 9d.; honour board, £65 5s., of which £20 had been promised by each of the donors, Major-General Downes and Dr. W. G. D. Upjohn. During the year the Council had been very active in the interests of members, and these activities, while being directly advantageous to members, unfortunately involved increased expenditure. Provision in the amended *Workers' Compensation Act* for increased payments for ambulance, medical and hospital services to £25 was a case in point. Other matters which had involved additional expenditure were the preparation of a new lodgé agreement, national insurance, and the attitude of the Branch regarding the hospital position and suburban dispensaries.

The Finance Subcommittee, now that subscriptions had been increased, regarded the financial position of the Branch as fairly satisfactory. Unnecessary expenditure was being avoided whenever possible, and savings were being effected in such items as stationery, postages and other office incidentals.

Reference to the statements shows that the Branch was again indebted to the British Medical Insurance Company. During the year the company had contributed £55 3s. for the purchase of books for the library, and made a direct grant of £480 towards the Medical Secretary's salary.

The British Medical Agency had failed to provide revenue for the Branch during the year. How this avenue might be improved as a financial medium was a matter that was receiving the consideration of the Finance Subcommittee. Here Dr. Mollison again pointed out that the extent to which the Branch could reap benefit from the medical agency and the insurance company was absolutely limited to the support the companies received from members. Whole-hearted support of the companies would mean success and profit in their operations, and the profit resulting from the success would accrue to the Branch and be passed on to the members. Dr. Mollison strongly appealed to members to give favourable consideration to

British Medical Association (Victorian Branch).

Statement of Receipts and Expenditure for Year ended December 31, 1937.

Receipts.

	£	s.	d.
To Cash in Hand, January 1, 1937	12	0	0
„ Subscriptions	5,824	2	3
„ Rent of Hall	19	10	6
„ Journal—Sales	5	9	3
„ List of Members	2	16	0
„ 1935 Annual Meeting (Suspense)	5	5	0
„ Car Attendant	0	5	0
„ Medical Benevolent Fund	182	1	0
„ Balance at National Bank of Australasia, Limited, December 31, 1937	209	3	4
	£6,260	12	4

Expenditure.

	£	s.	d.
By Balance at National Bank of Australasia, Limited, January 1, 1937	122	0	10
„ Medical Society of Victoria	2,683	9	8
„ *The British Medical Journal*	1,757	3	1
„ Medical Benevolent Fund	182	1	0
„ Rebates to Subdivisions	91	2	3
„ Salaries	1,038	12	0
„ C. S. Crouch—Pension	150	0	0
„ Postages	86	11	3
„ Stationery	34	7	1
„ Printing	9	0	9
„ Telephone and telegrams	10	15	3
„ Sundry Expenses	65	5	3
„ Audit Fees	5	5	0
„ Bank Charges	1	11	2
„ Collector's commission	6	6	3
„ Lanternist	3	0	0
„ Advertising	1	0	6
„ Donations and subscriptions	1	1	0
„ Cash in Hand, December 31, 1937	12	0	0
	£6,260	12	4

Compared with the Books and Accounts of the British Medical Association (Victorian Branch) and found to be in accordance therewith.

Edgar H. Ward, Financial Secretary.
C. H. Mollison, Honorary Treasurer.
Melbourne, January 18, 1938.

J. V. M. Wood & Co.,
Chartered Accountants (Aust.).

MEDICAL SOCIETY OF VICTORIA.

Statement of Receipts and Expenditure for Year ended December 31, 1937.

RECEIPTS.

	£	s.	d.
To Subscriptions	2,683	9	8
„ British Medical Insurance Company Grant	480	0	0
„ Medical Agency Commission	30	8	6
„ Instrument Sales—Commission	5	17	3
„ Sundries	3	13	3
„ Wood Jones Portrait Fund—Suspense	120	15	8
„ Cancer Fund—Suspense	10	0	0
„ Balance at National Bank of Australasia, Limited, December 31, 1937	195	5	9
	£3,529	10	1

EXPENDITURE.

	£	s.	d.
By Balance at National Bank of Australasia, Limited, January 1, 1937	57	0	8
„ THE MEDICAL JOURNAL OF AUSTRALIA	1,361	10	0
„ Library—			
Books and Journals £222 18 10			
Less Purchases by British Medical Insurance Company 55 3 0			
	167	15	10
„ Medical Secretary—Salary	900	0	0
„ Caretaker and Librarian—Salaries	186	6	0
„ C. S. Crouch—Pension	150	0	0
„ Travelling Expenses	36	18	0
„ Audit Fees	10	10	0
„ Honour Boards	65	5	0
„ Postages	74	19	3
„ Stationery	34	7	0
„ Printing	9	0	9
„ Rates, Taxes and Insurance	30	19	5
„ Legal Expenses	27	11	0
„ Telephone	41	16	1
„ Electric Light and Heating	38	3	9
„ Repairs	13	2	9
„ Entertainment	18	11	0
„ Bank Charges	3	3	7
„ Debenture Interest	302	10	0
	£3,529	10	1

Compared with the Books and Accounts of the Medical Society of Victoria and found to be in accordance therewith.

EDGAR H. WARD, Financial Secretary.
C. H. MOLLISON, Honorary Treasurer.
J. V. M. WOOD, & Co.,
Chartered Accountants (Aust.).

Melbourne, January 18, 1938.

the matter of placing their insurance and agency business with their own companies.

He had pleasure in submitting for adoption the audited statements of receipts and expenditure of the Victorian Branch of the British Medical Association and the Medical Society of Victoria. The statements, which are published herewith, were adopted.

NOMINATIONS AND ELECTIONS.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Cooper, John Huon, M.B., B.S., 1938 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Hoskisson, Sylvia Mary, M.B., B.S., 1936 (Univ. Sydney), Springfield, Gunnedah.

The undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Rosenthal, Martin Werner, M.D. (Hamburg), L.R.C.P. and S. (Edinburgh), L.R.F.P. and S. (Glasgow), 1937, 86, Park Street, South Yarra.

The undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Crankshaw, Thomas Pilkington, M.B., B.S., 1936 (Univ. Melbourne), 435, Wattletree Road, East Malvern, S.E.5.
Cuscaden, William George, junior, M.B., B.S., 1936 (Univ. Melbourne), Royal Melbourne Hospital, Melbourne, C.1.
Cole, William Harold James, M.B., B.S., 1937 (Univ. Melbourne), Royal Melbourne Hospital, Melbourne, C.1.
Barber, Alice Mary, M.B., B.S., 1906 (Univ. Melbourne), 29A, Kinkora Road, Hawthorn, E.2.
Flaxman, Elizabeth Holden, M.B., B.S., 1937 (Univ. Melbourne), Queen Victoria Hospital, Melbourne, C.1.
Lyons, Alexander, M.R.C.P., 1903, L.R.C.S., 1901 (Edinburgh), Church Street, Eaglehawk.
McLaren, Gilbert Henry Alexander, M.B., B.S., 1937 (Univ. Melbourne), La-La, Warburton.
Wright, Alison McQueen, M.B., B.S., 1935 (Univ. Melbourne), Queen Victoria Hospital, Melbourne, C.1.
Serong, Adrian Given, M.B., B.S., 1936 (Univ. Melbourne), 2, Berry Street, Clifton Hill, N.8.

Obituary.

HERBERT HENRY BULLMORE.

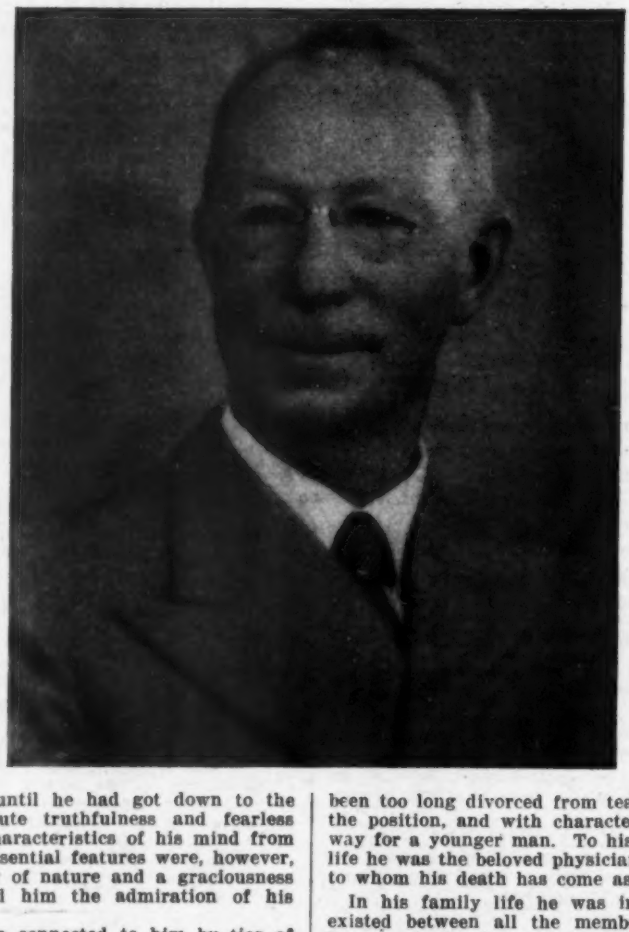
WE are indebted to the Honourable Dr. F. Wall, M.L.C., for the following account of the career of the late Dr. Herbert Henry Bullmore.

Herbert Henry Bullmore, for some thirty years a leading consulting physician and teacher of clinical medicine, died at Sydney on December 28, 1937.

Herbert Bullmore was educated at the Ipswich Grammar School and afterwards at the University of Edinburgh, and graduated M.B., Ch.B. in 1902, and gained his M.R.C.P.E. in 1903.

His career as a student was distinguished. He was President of the University Union and was a member of the famous Rugby side captained by A. B. Flett which went through the season undefeated and supplied a number of internationals to the various countries for that year. Bullmore gained his "blue" for football and rowing, and also represented Scotland against Ireland in 1902.

He was appointed to the Royal Infirmary as house physician to the late George Gibson, and later was resident surgeon to Sir Harold Stiles at the Edinburgh Children's Hospital. He practised at Bath, England, for some time, but decided to return to Australia, and commenced practice at Woollahra, but very shortly devoted himself entirely to his specialty, medicine.



Bullmore was honorary physician to Saint Vincent's Hospital, South Sydney Hospital, and Prince Henry Hospital, and at the time of his death was chief medical officer to the City Mutual Life Insurance Society Limited.

Bullmore was a sound physician and combined to an exceptional degree the two philosophic methods, deduction and induction. He possessed the special requirements for induction, namely, a desire for knowledge, the love of inquiry, acuteness of observation, and the habit of taking nothing for granted which he could verify himself. He deservedly enjoyed a high reputation as a physician, and the appreciation of his work by his contemporaries secured for him a large practice. Those of us who have had the privilege of working with the late Dr. Bullmore and obtaining thereby his guidance and valuable advice, must indeed deeply mourn our irreparable loss.

He was never satisfied until he had got down to the solid rock of fact; absolute truthfulness and fearless rectitude were the great characteristics of his mind from his earliest days. These essential features were, however, accompanied by a geniality of nature and a graciousness of manner which rendered him the admiration of his fellows.

To those of us who were connected to him by ties of friendship, the loss we have sustained is irreparable, but we are all enabled in glancing through the vision of years to survey a life of high purpose and of achievement, unmarred by any departure from the most perfect manhood. To all of us, his friends and colleagues, it has brought a painful sense of desolation; with those who stood to him in a yet nearer and dearer connexion we have the most profound sympathy.

Sir Charles Blackburn writes:

The reaction of the medical profession to the death of Dr. Herbert Bullmore has been predominantly that of grief over the death of a beloved personal friend. Though quite unknown when he settled in practice in Sydney, Bullmore's professional competitors very quickly recognized that he was not only a first class physician, but an amazingly good fellow for whom Bullmore was much too formal a title; so Bully he became, and it is as Bully he will be always affectionately remembered.

Essentially of a retiring nature and devoted to his profession and family life, he probably had not the least idea of the place he held in the affection of his colleagues; indeed the least hint of such a thing would have been greeted with that infectious, incredulous laugh that his friends grew to know so well and so loved to provoke.

His transparent honesty, good nature and friendliness were irresistible, and he found friends wherever he went. In the days when motor cars were more kittle-cattle than is dreamt of by the present generation, a story was current of Bully's car breaking down outside a remote county hamlet and limping in some hours later amid the tears, cheers and laughter of the entire village, who had in the brief interval completely taken the owner to their hearts and were bidding him a fond farewell.

His colleagues knew Bullmore to be an excellent physician, extremely careful in diagnosis, and with an almost uncanny flair for picking on the essentials. That his medical skill never had quite the general recognition that it deserved was undoubtedly due to his failure to early secure an appointment on a teaching hospital. He did splendid work for many years as honorary physician on the staff of the Saint Vincent's Hospital, but when, largely owing to the high standard the clinical work had attained during his service, the hospital was recognized as a clinical school by the university, and he had at last his opportunity for self-expression by accepting the lectureship in clinical medicine, he decided that he had been too long divorced from teaching to do full justice to the position, and with characteristic self-effacement made way for a younger man. To his patients of every walk in life he was the beloved physician, and there must be many to whom his death has come as an irreparable loss.

In his family life he was intensely happy, and there existed between all the members of his home circle a degree of affectionate understanding and companionship so ideal that there can be no doubt that if a break had to come he would have regarded himself as fortunate in that the lot should fall upon him.

Of an extremely powerful and athletic build, he was interested in all kinds of sport, and in his undergraduate days he achieved international fame as a footballer. In later life, motor cycling, boating, tennis and golf all claimed a share of his meagre spare time; but his real love was fishing, and the writings of the masters of medicine had to share his bookshelves with those of Isaak Walton. He tried his accomplished hand at every kind of angling—game fishing, beach casting and fly casting, each had their turn. He always spent his annual holiday under

canvas beside some secluded beach or unfrequented trout stream. His enthusiasm for everything he took up was remarkable, but it reached its acme over these camping expeditions. Many of his friends chaffingly asserted that he got more pleasure out of the evenings spent getting his gear ready for weeks before setting out than from the actual holiday. But the few privileged to share in these great adventures and see the gear in action knew otherwise. For them there will always remain a treasured memory of delightful strenuous days passing all too fast under the spell of that ideal camp mate who radiated happiness while doing the lion's share of the work. And so on the river bank we will leave him with his epitaph written by the incomparable Isaak: "An excellent angler, and now with God."

Dr. R. B. Wade writes:

Bullmore was a man of outstanding personality, strong mentally and physically, a lover of outdoor sport, in many forms of which he excelled—football, golf, tennis, fishing; a man of independent views, somewhat contemptuous of much that has become stereotyped in medicine, always willing to investigate new ideas and fresh points of view and to try out new methods if they appealed to his interest.

A close and firm friend to those whom he knew intimately, and on camping, fishing or similar trips his control of temper on trying occasions and his unselfishness and wish to undertake the lion's share of the hard work will be remembered by his companions.

By his death the State has suffered the loss of an able physician, a thinker on original lines, and, what is more, a teacher in medicine whose influence on the younger generation in things that matter was most marked and will bear fruit in the years to come.

Correspondence.

STREPTOCOCCAL PUERPERAL INFECTION.

Sir: The excellent articles by Dr. Chesterman and Dr. Durie (The Medical Journal of Australia, February 5) set forth very clearly the problems to be solved in the prevention of puerperal infection. Infections due to scarlatiniform contagia, as in the specific fever, sore throat and erysipelas, have been recognized as highly dangerous to the lying-in woman long before the birth of bacteriology, and the persistence of such "poisons" outside the body called forth the salutary measures adopted by the old practitioners of midwifery even unto the ordeal by fire.

The ubiquity of carrier infections among doctors, nurses and medical students compared with their distribution among the general population and the existence of pathogenic bacteria in measurable concentration in the environment of hospitals compared with open spaces and even domestic dwellings strongly point towards the measures now called for to prevent infection. The vogue of asepsis which has been pursued far too long will not remove the insalubrity of hospitals, but it will rather maintain and sustain the harmful endemicity of faucial and other sources from which is drawn the existing all-too-frequent sporadic outcrop of wound and genital infection. The aseptic pad applied during labour and the puerperium, and the aseptic dressings used for wounds will not eliminate carrier infection, having no destructive or even preservatizing control over discharges, actually are harbouring infections with enhanced virulence.

Masking is a problem almost impracticable. The ideal would be one charged with an antiseptic. Autoinfection is negligible compared with gross contagion; gloves have not helped us, and in any case are not adaptable for all persons and to every situation in midwifery practice. Dr. Durie's *dernier ressort* to invite all those who are carriers to refrain from attending confinements is not new nor is it likely to be popular. But, like masking, autoinfection and the glove, happily this handicap is amenable to correction.

The ablation or at least marked mitigation of the undue prevalence of sepsis urgently demands our attention, because of all places hospitals should show the best results. The first thing to do is to abandon pure asepsis and try the application of the antiseptic principle, the chief aim of which is not to kill germs in a wound, but to receive all discharges, infected or not, into a dressing that will render them inert and as well as totally unsuitable as a nidus for the growth of microorganisms of any kind, the source of secondary infections. Not only will wounds have a chance of overcoming primary infections attacking them by their powerful inherent defensive properties, but the risk of spread of infection from case to case or case to attendant (naso-pharyngeal regions in particular) will be removed. Then we will be able to advise those who, elsewhere, have contracted infections dangerous to patients to wear masks or stop away.

Thus I think it even more important to prevent faucial and other contaminations than to attempt to exclude their harmful effects by means which are in no sense infallible. Let us abandon pure asepsis and adopt the intelligent application of the antiseptic principle and then see what remains to be done. In my opinion, nothing except to keep on doing it.

Yours, etc.,

A. C. F. Halford, M.D., F.R.A.C.S.

Wickham House,
Brisbane,
February 11, 1938.

REPORT OF THE QUEENSLAND ROYAL COMMISSION ON MODERN METHODS FOR THE TREATMENT OF INFANTILE PARALYSIS.

Sir: In the issue of January 29, 1938, of The Medical Journal of Australia, there appears on page 223 a footnote which reads:

> Although it is not stated in the report, it must be presumed that the recommendations in Appendix E are those of the committee mentioned in Appendix D.—Editor.

The matter was recently brought under the notice of the Medical Journal Subcommittee, when I was requested to inform you that the report of the committee appointed by the council to visit Sister Kenny's clinic was given fully in Appendix D.

The recommendations in Appendix E were not made by that committee.

Yours, etc.,

J. G. Hunter,
Medical Secretary.

British Medical Association House,
135, Macquarie Street,
Sydney.
February 23, 1938.

Proceedings of the Australian Medical Boards.

QUEENSLAND.

The undermentioned have been registered, pursuant to the provisions of *The Medical Acts*, 1925 *to* 1935, of Queensland, as duly qualified medical practitioners:

Ashbarry, Reginald Ernest, M.B., B.S., 1936 (Univ. Sydney), Maryborough.

Crowley, Vivian George, L.M.S.S.A. (London), Innisfail.

Hossack, Francis Kenneth Lyle, M.B., B.S., 1938 (Univ. Sydney), Brisbane.

Diary for the Month.

MAR. 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
MAR. 11.—Queensland Branch, B.M.A.: Council.
MAR. 15.—New South Wales Branch, B.M.A.: Ethics Committee and Medical Politics Committee.
MAR. 16.—Western Australian Branch, B.M.A.: Branch.
MAR. 22.—New South Wales Branch, B.M.A.: Council (Quarterly).
MAR. 23.—Victorian Branch, B.M.A.: Council.
MAR. 24.—South Australian Branch, B.M.A.: Branch.
MAR. 24.—New South Wales Branch, B.M.A.: Annual Meeting.
MAR. 25.—Queensland Branch, B.M.A.: Council.
MAR. 29.—New South Wales Branch, B.M.A.: Council (Election of Officers and Standing Committees).
APR. 1.—Queensland Branch, B.M.A.: Branch.
APR. 5.—New South Wales Branch, B.M.A.: Organization and Science Committee.

Medical Appointments.

Dr. J. Ray has been appointed Medical Registrar at the Adelaide Hospital, Adelaide, South Australia.

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Dr. D. J. Crossin has been appointed Government Medical Officer at Dunedoo, New South Wales.

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Dr. H. V. Gillies has been appointed Government Medical Officer at Peak Hill, New South Wales.

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Dr. V. J. Bryant has been appointed Government Medical Officer at Coolangatta, Queensland.

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Dr. L. J. T. Pellew has been appointed Honorary Clinical Assistant to the Surgical Section at the Adelaide Hospital, Adelaide, South Australia.

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Dr. John Dale has been appointed a member of the Dental Board of Victoria, under the provisions of the *Medical Act*, 1928, of Victoria.

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Dr. J. C. Thom has been appointed Medical Officer of Health to the Youanmi Local Board of Health, Western Australia.

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Dr. A. M. Cudmore has been appointed President of the Medical Board of South Australia, according to the provisions of the *Medical Practitioners Act*, 1919, of South Australia.

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Dr. C. B. Sangster has been appointed Honorary Research Assistant to the Institute of Medical Science, and Dr. B. C. Smeaton has been appointed Honorary Anæsthetist at the Adelaide Hospital, Adelaide, South Australia.

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Dr. L. W. Jeffries, Dr. C. T. C. de Crespigny and Dr. W. Ray have been appointed Members of the Council of Medical and Veterinary Science, under the provisions of the *Institute of Medical and Veterinary Science Act*, 1937, of South Australia.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages XX to XXII.

CHILDREN'S HOSPITAL, CARLTON, VICTORIA: Staff Vacancies.
LEWISHAM HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Ophthalmic Surgeon.
THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY, NEW SOUTH WALES: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

Editorial Notices.

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